2nd printing
volume 1

FIREFOX
FIREFOX
FIREFOX

Operators Manual

Switch Information

Power On/Off Switch

The power on/off switch is located on the back of the cabinet toward the bottom (see Figures 1-1 and 1-2).

Utility Panel Switches

The volume control, coin counter(s), self-test switch, and auxiliary coin switch are on the utility panel. The utility panel is located inside the upper coin door (see Figures 1-1 and 1-2). The volume control adjusts the level of sound produced by the game. The coin counter(s) records the number of coins entered into the game. The self-test switch initiates the Self-Test Mode. The auxiliary coin switch credits the game without activating a coin counter. See Figure 1-4 and 5-2 for details of these switches.

NOTE

The utility-panel volume control adjusts the sound from the custom sound chips and from the stereo signal generated by the laser disc.

Volume Control for the Audio Jack

The volume control located below the control panel (see Figures 1-1 and 1-2) is used by the game player to adjust sound levels in his headphone set. The volume control on the utility panel does not affect the sound level in the headphones.

Option Switches

Three dual-inline-package (DIP) switches are located on the Main PCB at locations 3C, 6K, and 2M (see Figure 1-4). Switches 3C and 6K consist of eight toggle switches. Switch 2M consists of four toggle switches. Use these switches to select different game play and pricing options. (See Chapter 3 for PCB removal details and Tables 1-2 through 1-5 for option information.)

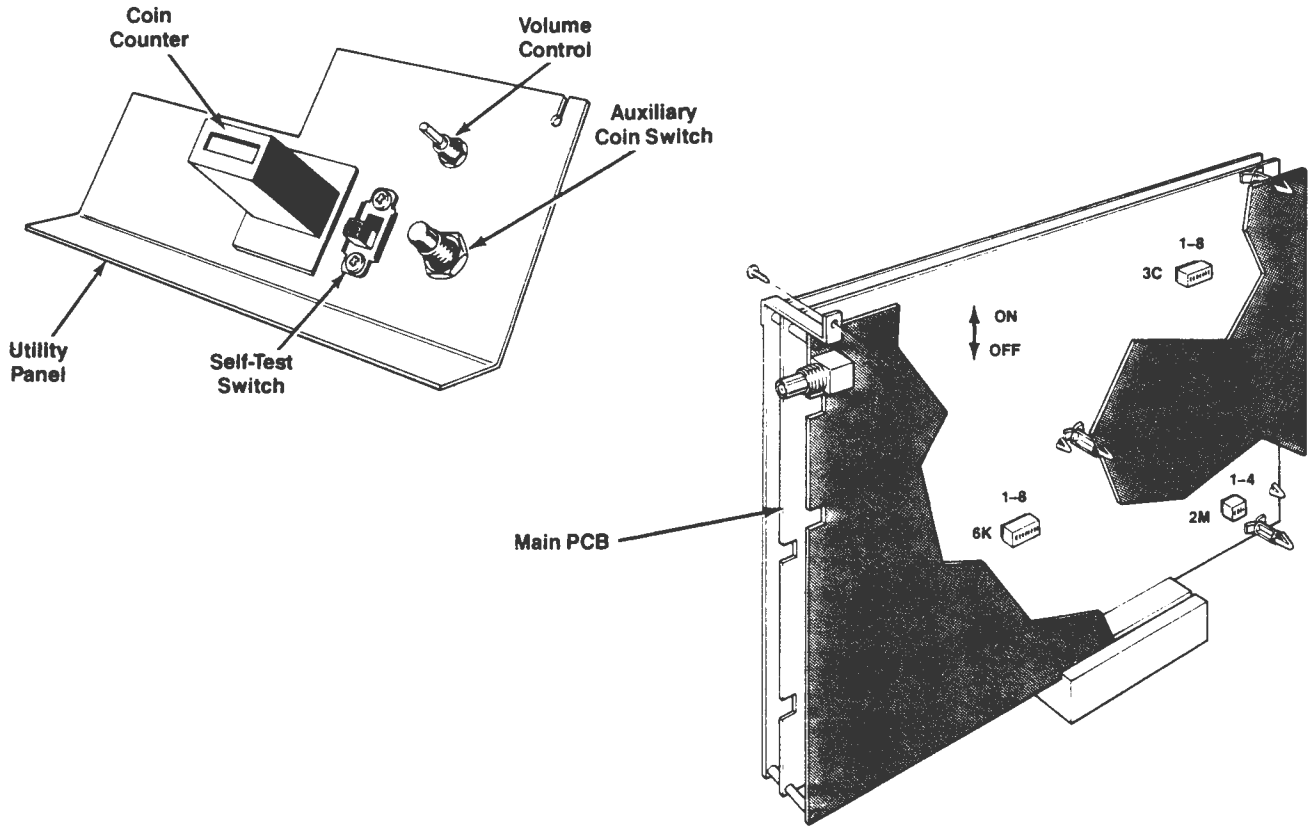


Figure 1-4 Switch Locations

Selecting the Game Options

FIREFOX has two eight-toggle option switches and one four-toggle option switch. These dual-inline package (DIP) switches are located on the Main PCB at locations 6K, 2M, and 3C (see Figure 1-4). The Main PCB is located between the Graphics PCB and the NTSC Demodulator PCB (see Figure 1-4).

- The DIP switch at location 6K is for selecting coin and credit options. These options include credits per coin, coin multipliers for the right and left coin mechanisms, the number of bonus coins added, and free play.
- The DIP switch at location 2M is for selecting how the game will handle coin-counter outputs. The hardware either ties the outputs of the coin-counter drivers together (for domestic games) or leaves the outputs of the coin-counter drivers separate (for international games). If the outputs are separate, different coin denominations can be counted.
- The DIP switch at location 3C is for selecting options relating to credits per mission, the rate of fuel used when FIREFOX is shot, the rate of fuel used by FIREFOX during travel, the amount of bonus fuel awarded to FIREFOX when it lands, and the maximum number of waves allotted for the UNLIMITED MISSION.

NOTE

If the manufacturer's recommended settings are not satisfactory for your location, you can change the game's option settings from the front of the cabinet. To take advantage of this convenience, open the coin door and move the self-test switch to the *on* position. Refer to Chapter 2 and Tables 1-2 through 1-5 for detailed switch setting information.

You may change settings of the option switches to suit your needs. Please refer to *Which Options Do I Change?* for specific guidelines on how to select and verify options so that your game gives maximum performance at your location.

Settings for option switches are listed in Tables 1-2 through 1-4. Options preset at our American factory as of February, 1984, are shown by the ◄ symbol; options preset at our European factory are shown by the * symbol. To verify option settings, refer to Chapter 2.

Table 1-2 Switch Settings for Coin and Credit Options

Settings of 8-Toggle Switch on FIREFOX Main PCB *(at location 6K)*								
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Option**
								Amount of Credit Per Coin Value
On	On							1 Credit ◄*
Off	On							½ Credit
On	Off							⅓ Credit
Off	Off							¼ Credit
								Left Coin Mechanism
		On						1 Coin ◄
		Off						2 Coins*
								Right Coin Mechanism
			On	On				1 Coin ◄*
			Off	On				4 Coins
			On	Off				5 Coins
			Off	Off				6 Coins
								Bonus Coin Adder
					On	On	On	0 Bonus Coins Added ◄
					Off	On	On	1 Bonus Coin Added for 2 Coins
					On	Off	On	1 Bonus Coin Added for 4 Coins
					Off	Off	On	2 Bonus Coins Added for 4 Coins
					On	On	Off	1 Bonus Coin Added for 5 Coins*
					Off	On	Off	1 Bonus Coin Added for 3 Coins
					On	Off	Off	0 Bonus Coins Added
					Off	Off	Off	Free Play

◄ *Manufacturer's recommended settings for American-made games*
**Manufacturer's recommended settings for European-made games*

Table 1-3 Switch Settings for Special Options

Settings of 8-Toggle Switch on FIREFOX Main PCB *(at location 2M)*				
1	2	3	4	Option
				Outputs of Coin Counters
On	On	On	On	Outputs of coin-counter drivers 1 and 2 tied together (for 1 counter) ◄
Off	On	On	On	Outputs of coin-counter drivers 1 and 2 separate (for 2 counters)*

◄ *Manufacturer's recommended settings for American-made games*
**Manufacturer's recommended settings for European-made games*

Sound in the Attract Mode

You can choose whether or not music is played in the Attract Mode **only** with the game software. To do this, open the coin door, set the self-test switch (on the utility panel) to *on* and press the auxiliary coin switch twice. The Game Options display will appear (see Figure 2-3). Move the flight control up or down. As you move the flight control, *YES* or *NO* will flash on the screen. If you pull the left trigger when *YES* is flashing, music will play every 7 minutes during the Attract Mode. If you pull the left trigger when *NO* is flashing, *NO* will appear at the bottom of the screen, and the game will be silent during the Attract Mode.

We recommend that games play music in the Attract Mode. The game is shipped with this option set to *YES*.

Option information is stored in the non-volatile random-access memory (NOVRAM). If the NOVRAM fails, the game defaults to silence in the Attract Mode. In this case, the Game Options display will show a *NO* to the right of *ATTRACT MUSIC*.

Table 1-4 Switch Settings for Game Play Options

Settings of 8-Toggle Switch on FIREFOX Main PCB *(at location 3C)*								
1	2	3	4	5	6	7	8	Option
								Credits Per Mission
On								2 Credits for Any Mission*
Off								2 Credits Required for 3000- & 6000-Mile Mission & 3 Credits Required for 9000-Mile and UNLIMITED JOURNEY Mission ◄
								Game Difficulty (Rate of Fuel Lost When Shot)
	On	On						Easy Game Play
	Off	On						Medium Game Play ◄*
	On	Off						Hard Game Play
	Off	Off						Hardest Game Play
								Fuel Usage (During Travel)
			On	On				Easy—Fuel Used Slowly
			Off	On				Medium—Fuel Used at a Medium Rate ◄*
			On	Off				Hard—Fuel Used Quickly
			Off	Off				Hardest—Fuel Used Very Quickly
								Bonus Fuel Amount Awarded Upon Landing
					On	On		Easy—Maximum Amount of Fuel Received
					Off	On		Medium—Moderate Amount of Fuel Received ◄*
					On	Off		Hard—Small Amount of Fuel Received
					Off	Off		Hardest—Very Small Amount of Fuel Received
								Waves per UNLIMITED JOURNEY
							On	Moderate—4 Waves Maximum ◄*
							Off	Hardest—8 Waves Maximum

◄ *Manufacturer's recommended settings for American-made games*
**Manufacturer's recommended settings for European-made games*

Which Options Do I Change?

Before you change any option setting, be sure you can answer "yes" to all of the following questions:

1. Is your FIREFOX game set with the manufacturer's recommended options? If not, do you know for what options the game is set?

   If the game is set with the manufacturer's recommended options, proceed to question 2. If the game is not set with the manufacturer's recommended options, then:

   a. Enter the Self-Test Mode by setting the self-test switch (on the utility panel) to the *on* position.

   b. Reset the options (refer to Chapter 2).

   c. Set the self-test switch *off* to end the Self-Test Mode and return to the Attract Mode.

   d. Enter self-test again and verify your option settings on the Game Options display.

2. Do you know which option each toggle switch controls? Do you know the effect each different setting has on the overall game play?

   If you do know, proceed to question 3. If you do not, refer to *Option Switch Descriptions and Effects* and to Tables 1-2 through 1-5.

3. Do you have a general idea of what you want out of your game (e.g., the difficulty level for the player, the average game time, etc.)?

   If you do, you have been monitoring the statistics contained in the Self-Test and you should proceed to question 4. If you do not, you should:

   a. Enter the Self-Test Mode.

   b. Advance to the statistics display (see Chapter 2).

   c. Record the average game time and the percentage of play. Also record the date and time the information was taken. Continue to monitor these statistics to help you determine an answer to question 3. We recommend you monitor this information for a minimum of one full day; and for a maximum of one week.

4. Have you looked at Tables 1-2 through 1-5 to determine possible option settings?

   If you have, enter the Self-Test Mode and set the options you desire. Record and monitor the statistics as often as you can.

   If you haven't looked at these tables yet, refer to them now. Determine which options would best obtain the results you want.

Option-Switch Descriptions and Effects

Difficulty Option changes the amount of fuel lost when an enemy shot hits FIREFOX. This option immediately affects the player's fuel supply when the FIREFOX is hit.

Gas Usage Option changes the amount of fuel lost when FIREFOX is traveling at high or low altitudes. This option slowly, but continuously, affects the player's fuel supply throughout game play.

Bonus Gas Option changes the amount of fuel awarded when FIREFOX lands at the refueling station. This option greatly impacts the player's fuel supply at the end of a wave.

Unlimited Journey Option changes the maximum number of waves given (either 4 or 8) when a player selects the Unlimited Journey Mission. This option affects average game times and therefore, the game's earning potential.

Table 1-5 Difficulty Levels Based on Game Options

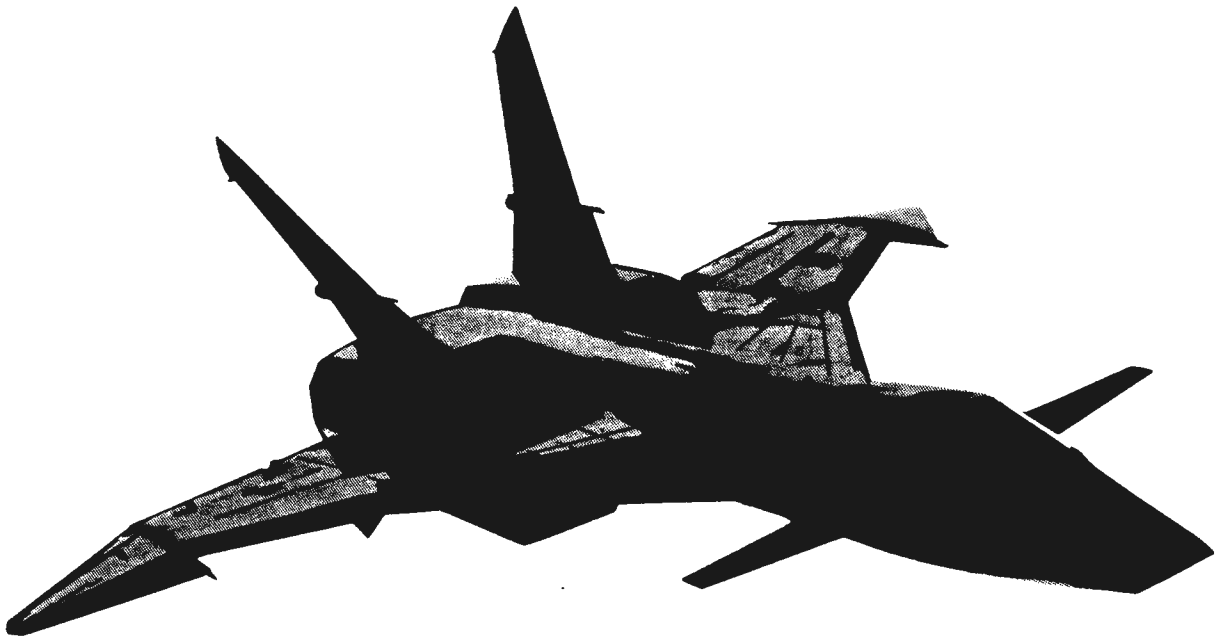
Difficulty Scale	Game Difficulty	Fuel Usage	Bonus Fuel
5	Easy	Easy	Easy
4	Moderate	Easy	Easy
3	Easy	Moderate	Moderate
2	Moderate	Moderate	Easy
1	Moderate	Easy	Moderate
0◄•	Moderate	Moderate	Moderate
-1	Moderate	Hard	Moderate
-2	Moderate	Hardest	Moderate
-3	Moderate	Moderate	Hard
-4	Moderate	Hard	Hard
-5	Hard	Moderate	Moderate
-6	Moderate	Moderate	Hardest
-7	Hardest	Moderate	Moderate
-8	Hard	Hard	Moderate
-9	Hard	Hard	Hard
-10	Hard	Hardest	Hard
-11	Hard	Hardest	Hardest
-12	Hardest	Hardest	Hardest

◄ *Manufacturer's recommended settings for American-made games*
• *Manufacturer's recommended settings for European-made games*

In Table 1-5, zero (0) represents the difficulty level set at the factory. Using this or another known setting, you can use the table to produce settings which are incrementally easier or harder. Table 1-4 lists the specific settings for the general information listed in Table 1-5. Level 5 represents the easiest overall game play and level -12 represents the hardest. If you wish to change the game play from level 0, we suggest you choose the 1 or -1 difficulty level, because each additional level change will have a substantially increased effect over the previous settings.

NOTE

For most locations, we recommend staying between levels 3 and -5. Going out of this range will negatively affect the game play and profitability of this game.



Game Play

FIREFOX is a one-player laser-disc game with a color raster video display. It has five modes of operation: Attract Mode, Select-A-Mission Mode, Play Mode, High-Score Mode, and Self-Test Mode.

The FIREFOX game is a first for Atari because it is:

- The first laser-disc game designed by Atari.
- The first ATARI game that allows a player to use headphones (his own).
- The first time that the ATARI flight control uses thumb buttons.
- The first generation of games that Atari is packaging in a high-tech cabinet.

The sound effects for FIREFOX are seismic! They intensify the Attract and Play Modes with music, sound effects, and lots of phrases from the movie soundtrack. You'll hear Clint Eastwood say the following:

"Homing device attached."
"I'm going to take her up."
"I'm going to take her down."
"I'm going to take her down low to avoid an infrared fix."
"Let's see what this thing can do. . ."
"Missile cruiser contact dead ahead. . ."
"Polar pack's in sight now."
"Homing device just activated."
"ECM picking up infrared detection beams."
"They've got me locked on."
"Contact point 90 miles and I'm flying on air."
"We've got visibility again."
"Estimated 3 miles to target."
"Radar says all clear."
"Nothing can touch us now."
"Better ice up a cold one."
"I'm coming home."
"Hope it burns up the sky."
"Second FIREFOX. . ."
"Ah, we've got company. . ."
"I'm on reserve tanks now."
"I'm the best there is."
"Boy is this a machine!"
"They've spotted me."
"Say brother, that's about as good as it gets."

During game play, Clint's voice is generated by the speech synthesizer chip, but during the Attract Mode, his voice and other sounds are from the laser disc. FIREFOX uses "stereo image enhancement" to simulate different distances between you and the sound source. This enhancement is particularly realistic if you use stereo headphones while playing the game.

Attract Mode

The Attract Mode displays exciting sequences and sound effects from the movie. Then the words *PULL TRIGGER TO START,* © *1982 WARNER BROS. INC.* and © *1983 ATARI, INC. ALL RIGHTS RESERVED* appear, while the footage continues to roll underneath it.

The targets (radar, oncoming shots, missiles, and planes) are defined.

The high-score table containing the most recent seven high scores appears during the Attract Mode.

Select-A-Mission Mode

When enough credits are registered to start game play, pull the trigger to start the Select-A-Mission Mode. Four missions appear on the screen—a 3000-mile mission, 6000-mile mission, 9000-mile mission, and a PRO MISSION. A map of each mission appears above the number of miles. (The PRO MISSION appears as a question mark because the course may vary.) All of the courses traverse western Russia and the Ural mountain range.

The 3000-mile mission has one leg, the 6000-mile mission has two legs, and the 9000-mile mission has three legs. In FIREFOX, a leg is similar to a wave.

You have nine seconds to select a mission. To make a selection, you must move the flight control to highlight the desired mission in gold. Then press the trigger.

The Play Mode starts when a mission is selected or after nine seconds of the Select-A-Mission Mode has elapsed.

Play Mode

Play is based on the FIREFOX movie—your mission is to escape detection and successfully deliver the FIREFOX super-plane to the United States government. You have one life, but during that life you may complete more than one mission.

ATARI LASERVIDEO™ graphics combine the laser-disc image with the digitized image of the FIREFOX nose. As you play the game, you can see your target through the graphic overlays. This is an aid during game play.

When the Select-A-Mission Mode ends, the FIREFOX engine revs and the instructions for your chosen mission appear on the screen.

Three numbers appear across the bottom of your screen. The number on the left is your score, the number in the middle is the number of targets you've shot down, and the number on the right is the number of fuel units you have remaining (you start with 80 units).

To begin your mission, fire with any switch. Messages appear during game play to guide you.

NOTE

When in the sky you use less fuel than when you're near the ground. However, in the sky you can be detected by twice as much radar. Radar detection increases as game play progresses.

There are up to seven "Altitude Select" screens, depending on the mission you chose. When you see the Altitude Select screen, move the flight control up or down to select whether you want to fly high or near the ground. The Altitude Select screen is a transitional third-person view of the FIREFOX (you'll notice that the FIREFOX and "Heads Up" display disappear from view).

If you are flying into a fatal situation (for example, flying into an ice cliff), an instruction clip from the movie intervenes. This clip shows a pilot's gloved hands pulling back on the flight control.

The words *HOMING DEVICE ACTIVATED* appear as you near the end of the mission leg. This is a tie-in with the movie and means you are approaching the American submarine. Entering the trench also marks the final leg of the mission. During the landing sequence, you'll see a quick overhead view of the submarine, which is where you refuel. After you refuel, a bonus screen appears. You receive bonus points for fuel remaining, the mission completed, rockets remaining, and a good landing.

Description of Targets. Radar is a target. You are in a stealth plane, so only infrared (not regular) radar can detect you. Infrared radar will appear on the screen as small concentric circles. If you do not destroy the infrared radar, it grows. The outer three rings of the radar turn black as you are detected.

Shots are also targets. You and the enemy both have two types of projectiles (or shots)—one is a guided missile that grows and hits head on; the other is a volley of shots that behaves like machine gun spray. When you hit an oncoming shot, black flak appears (it's like a black cloud.) When you are hit by a volley of shots, a yellow flash covers the screen and you lose one fuel unit. (It's a good thing you have a self-sealing tank!) When you are hit by a missile, a yellow and black flash covers the screen and you lose a larger amount of fuel units than the enemy projectile.

Planes are targets. When you hit a plane, flaming flak appears. Flaming flak also appears when you hit any other element (e.g., secret Soviet ground bases).

Description of Weapons. As the FIREFOX pilot, you have some useful weapons at your disposal. You have bullets, guided missiles, and a "Heads Up" display.

You start each mission leg with unlimited bullets and four guided missiles under your wings. The missiles *are fired with the thumb buttons on the flight control.* When you fire a missile, you guide it by moving the flight control. The missile always moves toward the crosshair. A missile will kill until its life is expired!

The "Heads Up" display is designed to communicate information to you quickly. This display includes the perimeter of the sight with the crosshair inside it. The horizontal red lines on either side of the crosshair show your fuel level. Each line represents three fuel units. Yellow rockets show you how many guided missiles you have left under your wings.

Scoring Information. When the Altitude Select screen appears, you get 10,000 bonus points if you were not detected. The screen will display either *10,000 BONUS* and *AVOIDED DETECTION* or *DETECTED*.

After you have landed, you get bonus points for:

- finishing each leg of the mission (3000 points for each leg completed)
- fuel remaining (500 points for each unit of fuel left)
- missiles remaining (1500 points for each missile left)

Hints for Game Play

- The amount of fuel you receive when you land depends upon the number of targets you've shot, so shoot all the targets you can!
- Use the guided missiles when the enemy is aggressively attacking you, because these missiles keep killing until they are spent.
- Change altitude if you have been detected.
- You are not shot at if you're undetected, so be sly.
- You are not penalized for missed shots, so shoot like crazy at targets and even shoot at things that aren't obvious, because you may destroy a secret object or camouflaged land base. These ground bases will shoot at you if you've been detected!

High-Score Mode

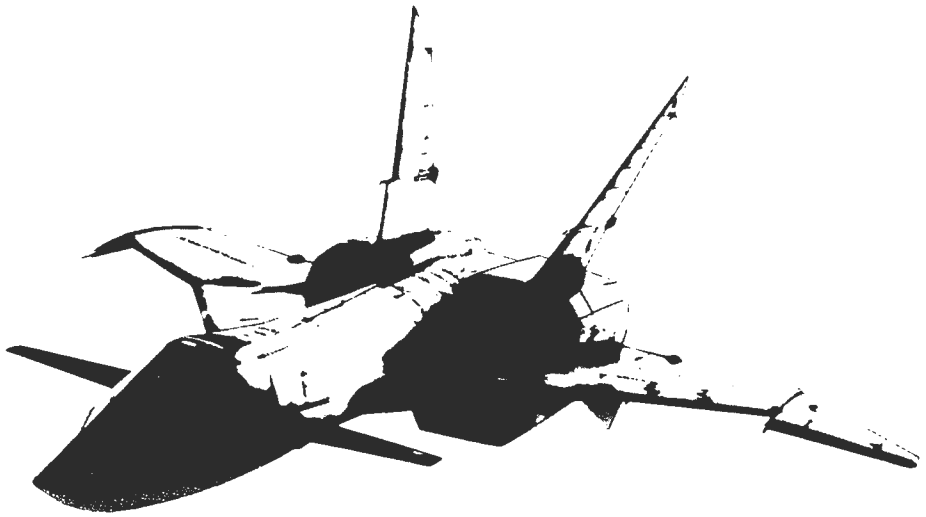
FIREFOX has four tables for entering initials—one table for each mission plus a table called *Most Recent High-Score Table*. This fifth table keeps track of the top seven scores for the most recent players, and acts as a multi-player score sheet for a group of players. The table displays only the best score of each player in the order of play (the same person cannot fill up the entire table). The *Most Recent High-Score Table* is displayed in the Attract Mode.

The first four tables contain space for 60 pilots' initials. To get into the high-score table desired, pull the flight control to the center, then to the right. To scroll a high-score table, pull the flight control up or down. To view previous tables, pull the flight control to the left.

If credits remain in the game, pull a trigger to start the Select-A-Mission Mode. In Attract Mode, turn the flight control to the right to view the high-score tables.

Self-Test Mode

Self-Test is divided into two sections. The first section shows game statistics and allows the operator to reset certain statistics or change options by using the flight control. The second section is designed to allow checking of game switches, hardware failures, potentiometer adjustments, and video display adjustment. Self-Test may be entered any time during the Attract Mode. See Chapter 2 for complete Self-Test information.



Sound Display

Press the auxiliary coin switch to obtain the Sound Display as shown in Figure 2-8. This display verifies that the music and sound effects generators are operating properly. Sounds 00 through 03 generate a series of four long tones (one for each channel or voice) should be heard with each succeeding tone rising in frequency, which indicates that the custom sound integrated circuit at location 3/4J is good. Press the right-hand fire trigger to cycle through a series of 44 available sounds numbered from 00 to 3E (not all are used during game play). Press the left-hand fire trigger to cycle through the same sound segments in the reverse direction from sound number 3E to 00. If either fire trigger is pressed after the sound segment starts, that sound segment will finish and the next segment selected will start. Table 3-3 describes the sounds selected with the Sound Test display. Sounds occur on top of each other; voices talk one at a time.

Table 2-3 Game Sounds

Sound No.	Description
00	Custom 1 Test Tones (4 single tones)
01	Custom 2 Test Tones (4 double tones)
02	Custom 3 Test Tones (4 triple tones)
03	Custom 4 Test Tones (4 quadruple tones)
04	Voice: *Homing device attached.*
05	*I'm going to take her up.*
06	*I'm going to take her down.*
07	*I'm going to take her down to avoid an infrared fix.*
08	*Let's see what this thing can do.*
09	*Missile cruiser dead ahead.*
0A	*Polar pack's in sight now.*
0B	*Homing device just activated.*
0C	*ECM picking up infrared detection beams.*
0D	*They've got me locked on.*
0E	*Contact point 90 miles and I'm flying on air.*
0F	*I've got visibility again.*
10	*Estimated 3 miles to target.*
11	*Radar says all clear.*
12	*Nothing can stop us now.*
13	*Better ice up a cold one.*
14	*I'm coming home.*
15	*Hope it burns up the sky.*
16	*Second Firefox.*
17	*Ah, we've got company.*
18	*I'm on reserve tanks now.*
19	*I'm the best there is.*
1A	*Boy, is this a machine.*
1B	*They spotted me.*
1C	Bing
1D	Short Tune

(continued)

Table 2-3 Game Sounds, continued

Sound No.	Description
1E	Branch Point (altitude select)
1F	Chime
20	Descending (not used in game)
21	Turbine Fade Out
22	Enemy Guns
23	Explosion of Enemy Guns
24	Windshield Hit of Enemy Guns
25	Screen flash for Enemy Guns
26	Enemy Missile Launch
27	Enemy Missile Explosion
28	Homing Signal 1 (2 or 3 tones)
29	Homing Signal 2 (2 or 3 tones)
2A	Homing Signal
2B	First Initial (low tone)
2C	Second Initial (medium tone)
2D	Third Initial (high tone)
2E	Long Explosion (left)
2F	Long Explosion (right)
30	Low Fuel Fast (multiple tones)
31	Low Fuel Slow
32	Na-Na-Na-Na-Na-Na
33	Player's Gun
34	Player's Missile
35	Radar Detection Left (2 tones)
36	Radar Detection Right (2 tones)
37	Radar Expansion Left (multiple tones)
38	Radar Expansion Right (multiple tones)
39	Warning Tones (high tones)
3A	Warning Tones (low tones)
3B	Rub-out (2 raspy tones)
3C	Screech
3D	High Score to Date Tune
3E	Voice: *Say brother, that's about as good as it gets.*

Figure 2-8 Sound Display

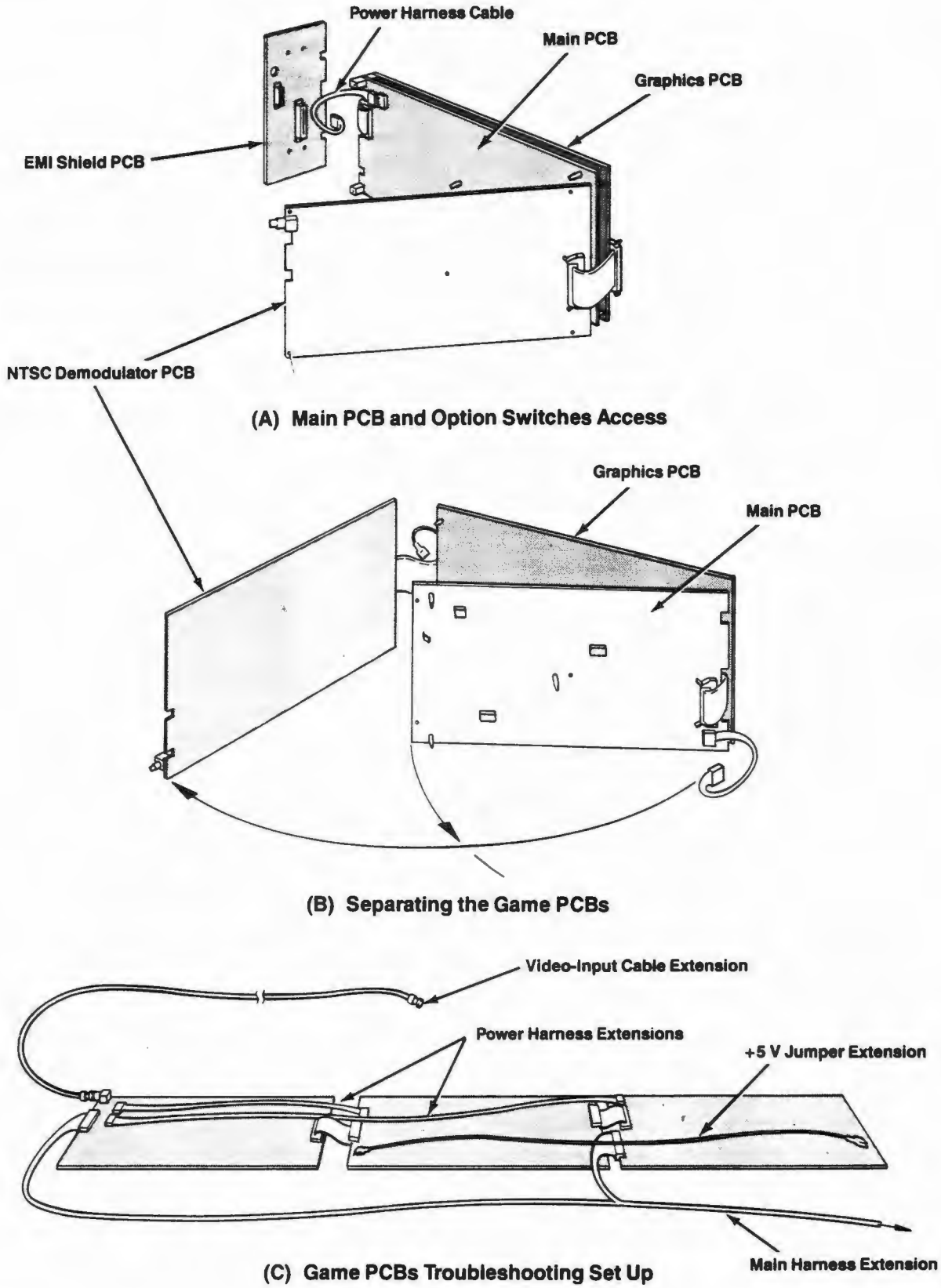


Figure 3-4 Removing and Separating the Game Printed-Circuit Boards

2nd printing
volume 2

FIREFOX

Illustrated Parts Lists

Illustrated Parts Lists

5 Illustrated Parts Lists—Common to Both Cabinets

6 Illustrated Parts Lists—Upright Cabinet

7 Illustrated Parts Lists—Sit-Down Cabinet

NOTE

For set up, self-test, maintenance, and trouble-shooting information, refer to TM-253-01.

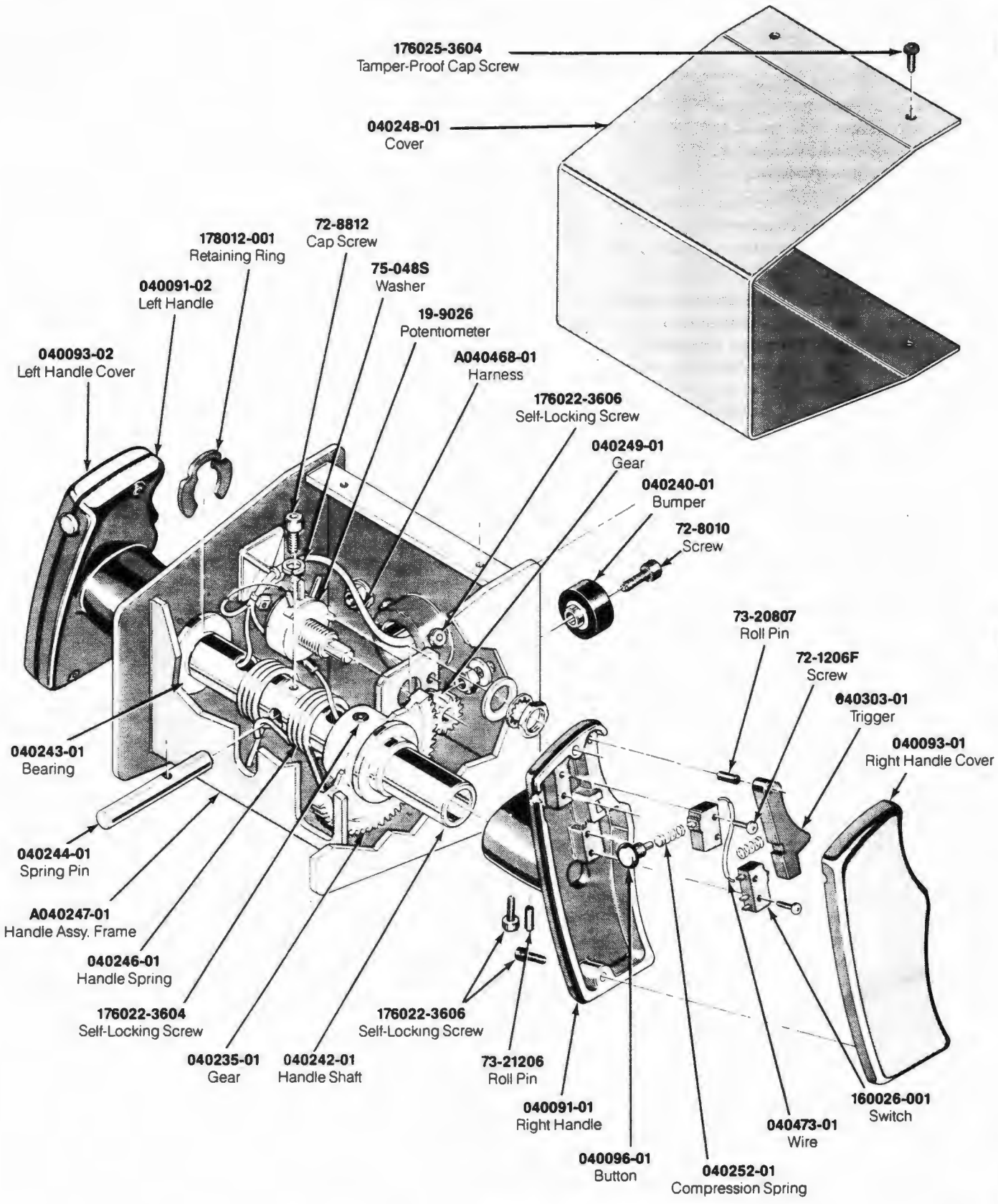
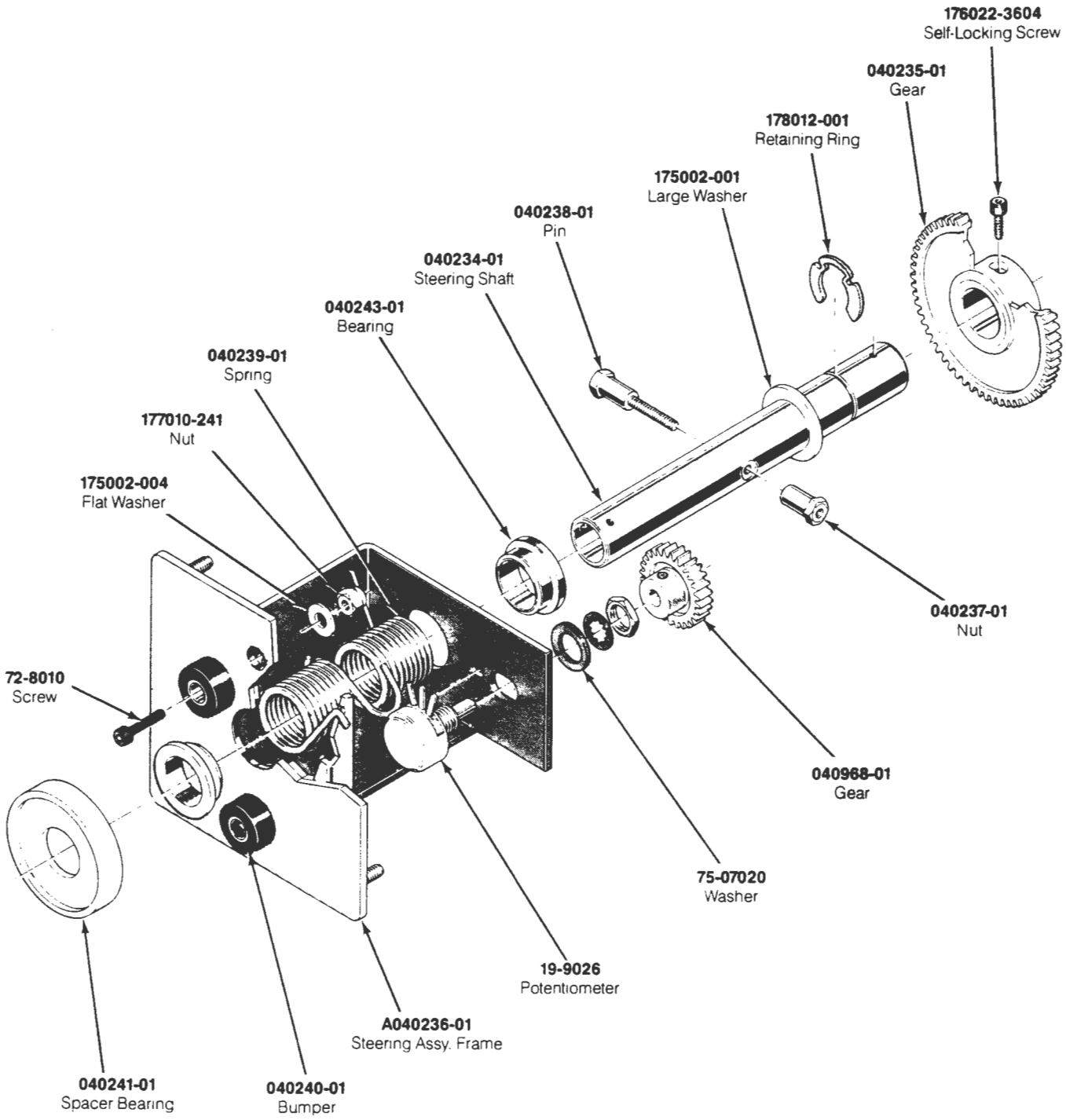


Figure 5-1 Flight Control Assembly
A040233-02 G



See Chapter 3 for lubrication information.

Figure 5-1 Flight Control Assembly, continued
A040233-02 G

Flight Control Assembly
Parts List

Part No.	Description
A040236-01	Steering Assembly Frame—includes:
040243-01	Modified Bearing
040555-01	Steering Frame Weldment
72-L2S510	#¼-20 × ⅝-Inch Long Self-Clinching Stud
A040247-01	Handle Assembly Frame—includes:
040243-01	Modified Bearing
040556-01	Frame Handle Weldment
A040468-01	Flight Control Harness Assembly
19-9026	5 kΩ Potentiometer
72-1206F	#2-56 × ⅜-Inch Cross-Recessed Pan-Head Machine Screw
72-8010	#10-32 × ⅝-Inch Socket-Head Cap Screw
72-8812	#8-32 × ¾-Inch Socket-Head Cap Screw
73-20807	⅛-Inch Diameter × 7/16-Inch Long Spring Roll Pin
73-21206	Roll Pin
75-040S	#10 Split-Lock Washer (not shown)
75-048S	#8 Split-Lock Washer
75-07020	0.390-Inch I. D. Flat Washer
040091-01	Right Handle
040091-02	Left Handle
040093-01	Right Handle Cover
040093-02	Left Handle Cover
040096-01	Button
040234-01	Steering Shaft
040235-01	60-Tooth Spur Gear
040237-01	Anchor Nut
040238-01	Anchor Pin
040239-01	Steering Torsion Spring
040240-01	Stop Bumper
040241-01	Spacer Bearing
040242-01	Handle Shaft
040244-01	Spring Handle Pin
040246-01	Handle Torsion Spring
040248-01	Cover
040249-01	14-Tooth Spur Gear
040252-01	Compression Spring
040303-01	Trigger
040473-01	Jumper Wire
040968-01	28-Tooth Spur Gear
160026-001	SPDT Snap Switch
175002-001	0.750-Inch I. D. Large Washer
175002-004	#10 Flat Washer
176008-106	#10-32 × ⅜-Inch Self-Locking Socket-Head Cap Screw (not shown)
176022-3604	#6-32 × ¼-Inch Self-Locking Socket-Head Cap Screw
176022-3606	#6-32 × ⅜-Inch Tamper-Proof Socket-Head Cap Screw
176025-3604	#6-32 × ¼-Inch Tamper-Proof, Self-Locking, Button-Head Cap Screw
176026-3610	#6-32 × ⅝-Inch Tamper-Proof Socket-Head Cap Screw
177010-241	#10-32 Nylock Hex Nut
178012-001	Retaining Ring for .750-Inch Diameter Shaft

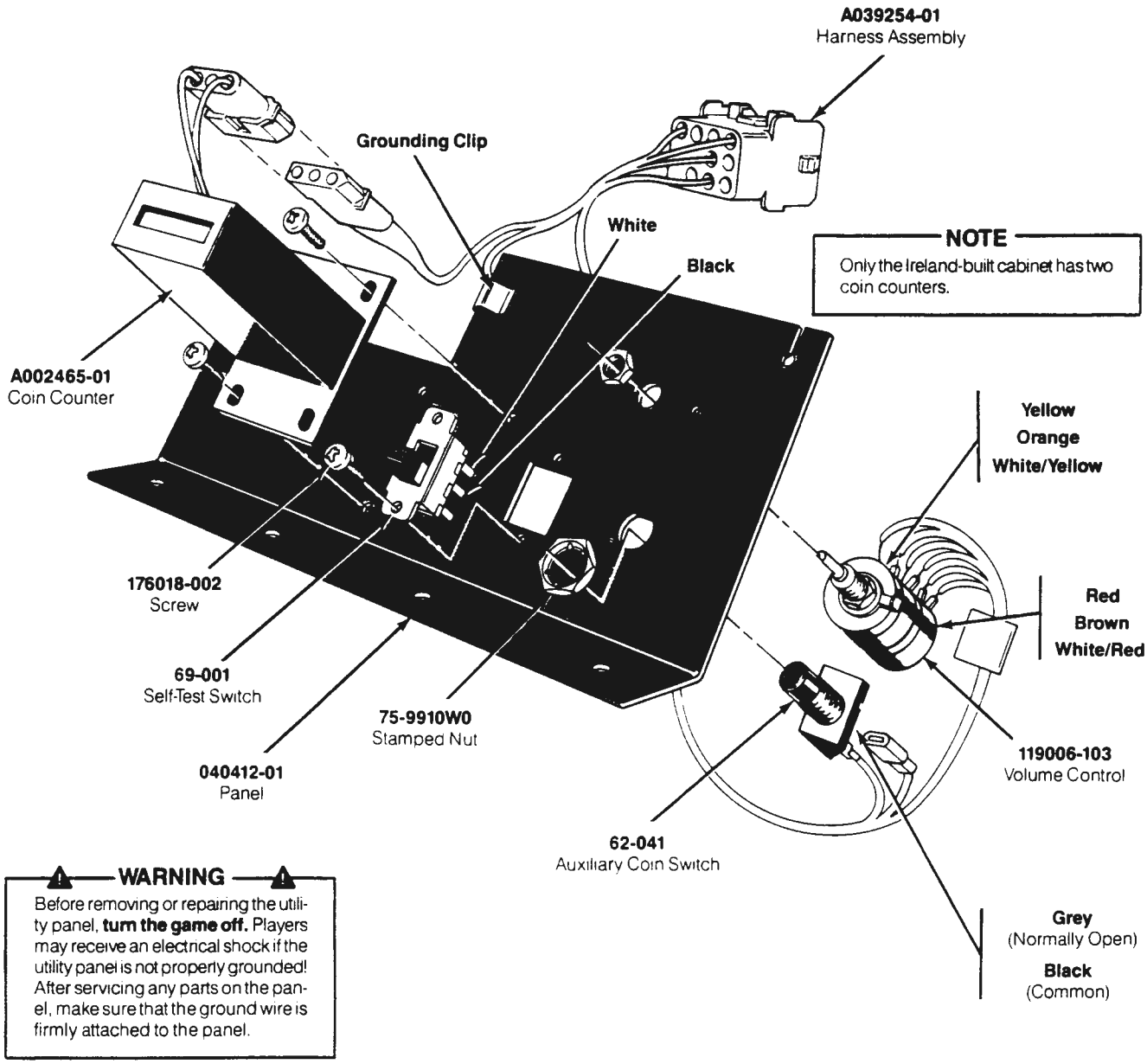


Figure 5-2 Utility Panel Assembly
A040413-01 B
Parts List

Part No.	Description
A002465-01	Coin Counter
A039254-01	Volume Control Harness Assembly (includes grounding clip)
62-041	SPDT Pushbutton Auxiliary Coin Switch with Black Cap
69-001	DPDT Self-Test Switch
040412-01	Component Panel
75-9910W0	$^{15}/_{32}$-32 Stamped Nut
119006-103	Dual Volume Control
176018-002	#6-32 × ½-Inch Thread-Forming Machine Screw

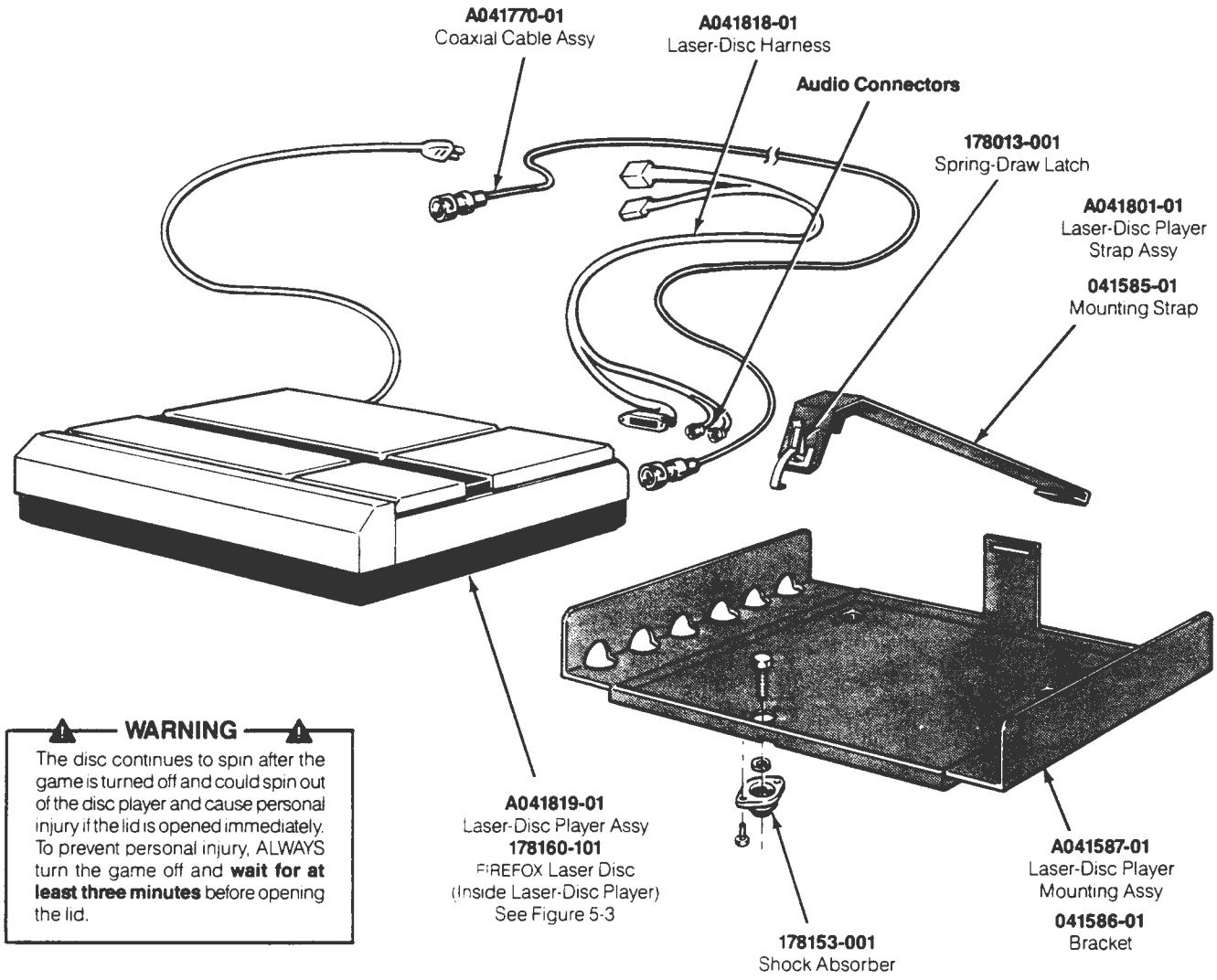


Figure 5-3 Laser-Disc Player Mounting Parts List

Part No.	Description
A041587-01	Laser-Disc Player Mounting Assembly—consists of
041586-01	Laser-Disc Player Mounting Bracket
178153-001	Shock Absorber Isolator
A041770-01	Coaxial Cable Assembly (connects to Demodulator PCB, protrudes through EMI Shield PCB, and attaches to Laser-Disc Player)
A041801-01	Laser-Disc Player Strap Assembly—consists of
78-6901202	Vinyl Foam Single-Coated Adhesive Tape ¾-Inch Wide x ⅛-Inch Thick—5 ¼ inches required—not shown
041585-01	Mounting Strap
178013-001	Spring-Draw Latch
A041819-01	Laser-Disc Player Assembly—consists of
A041818-01	Laser-Disc Harness
171059-001	Laser-Disc Player
178160-101	FIREFOX Laser Disc

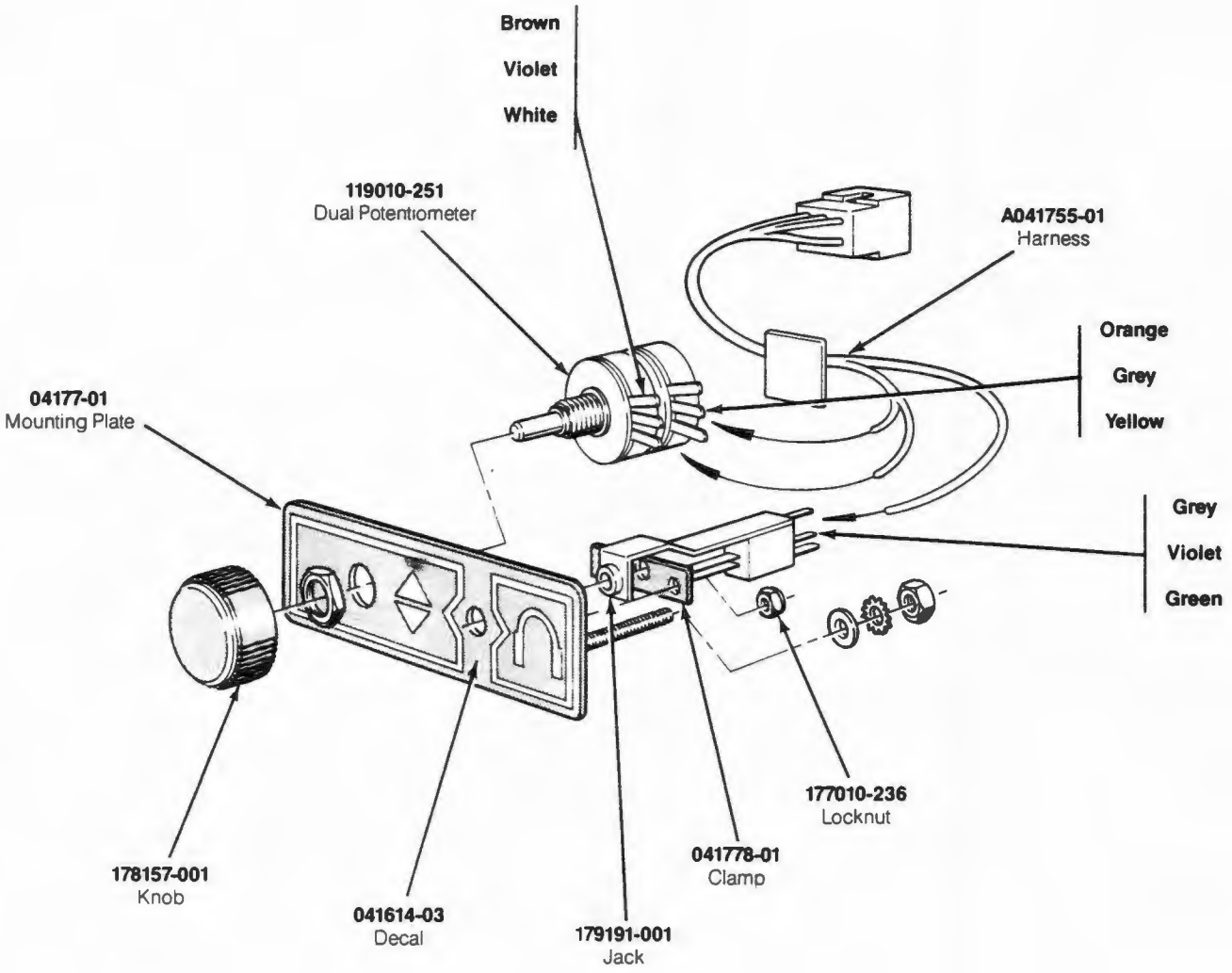


Figure 5-4 Audio Jack Assembly
A041776-01 A
Parts List

Part No.	Description
A041755-01	Harness (includes connector)
041614-03	Decal for Audio Jack Plate
041777-01	Audio Jack Mounting Plate
041778-01	Audio Jack Clamp
119010-251	250 Ω Dual Potentiometer
177010-236	#6-32 Polymer Hex Locknut
178157-001	Volume Control Knob
179191-001	3.5 mm Jack

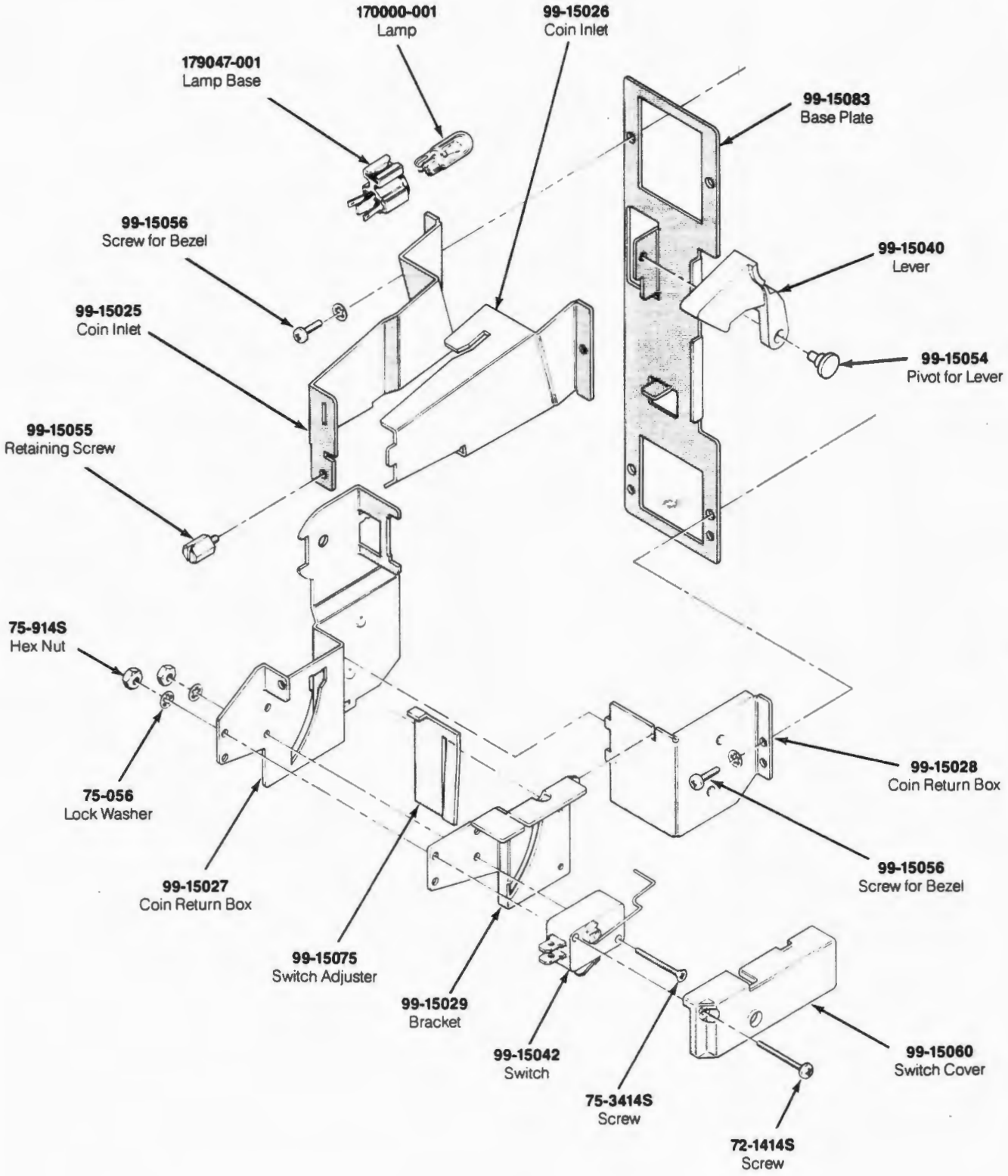


Figure 5-5 Coin Controls, Inc. Coin Door Assembly 171034-xxx A

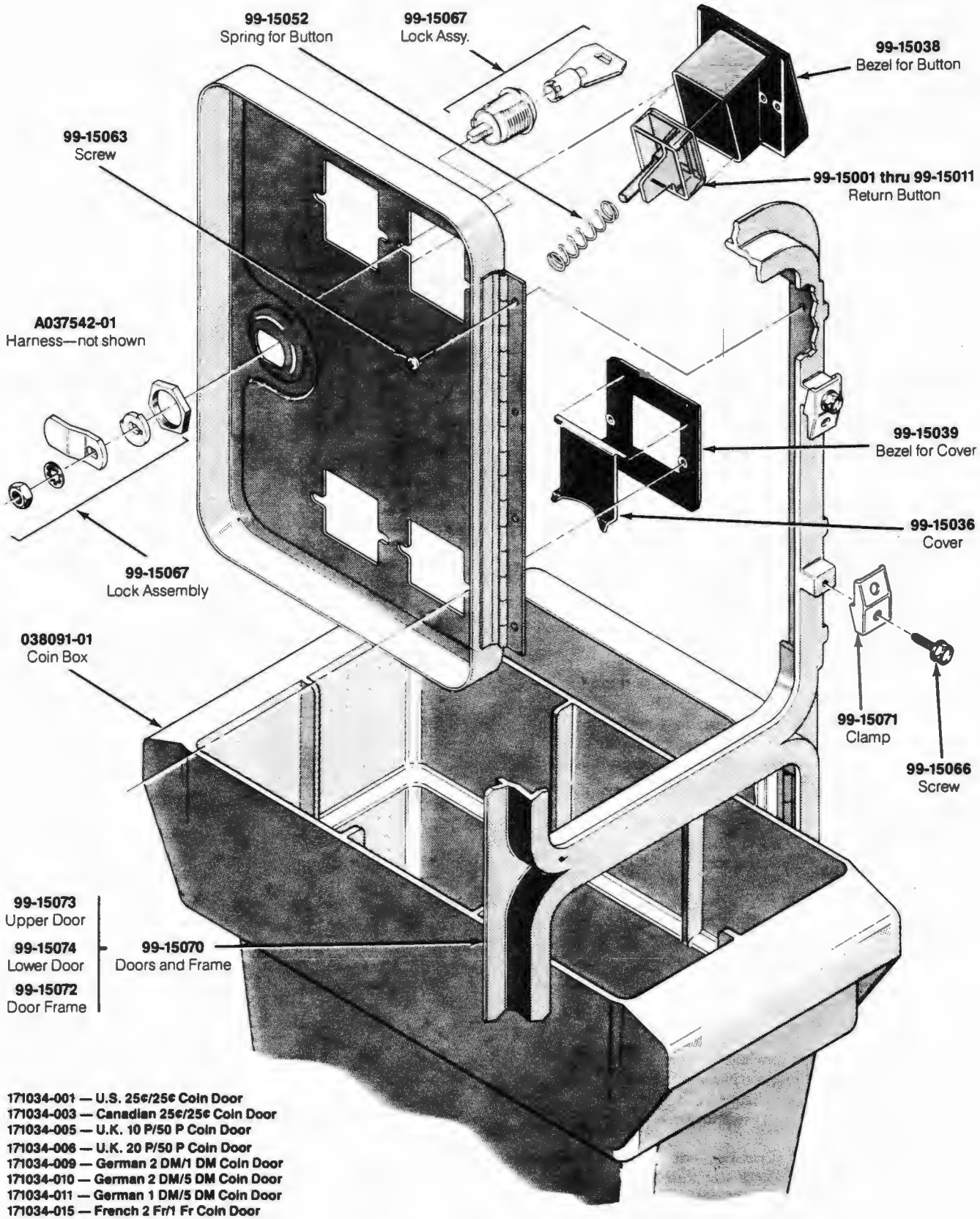


Figure 5-5 Coin Controls, Inc. Coin Door Assembly, continued
171034-xxx A

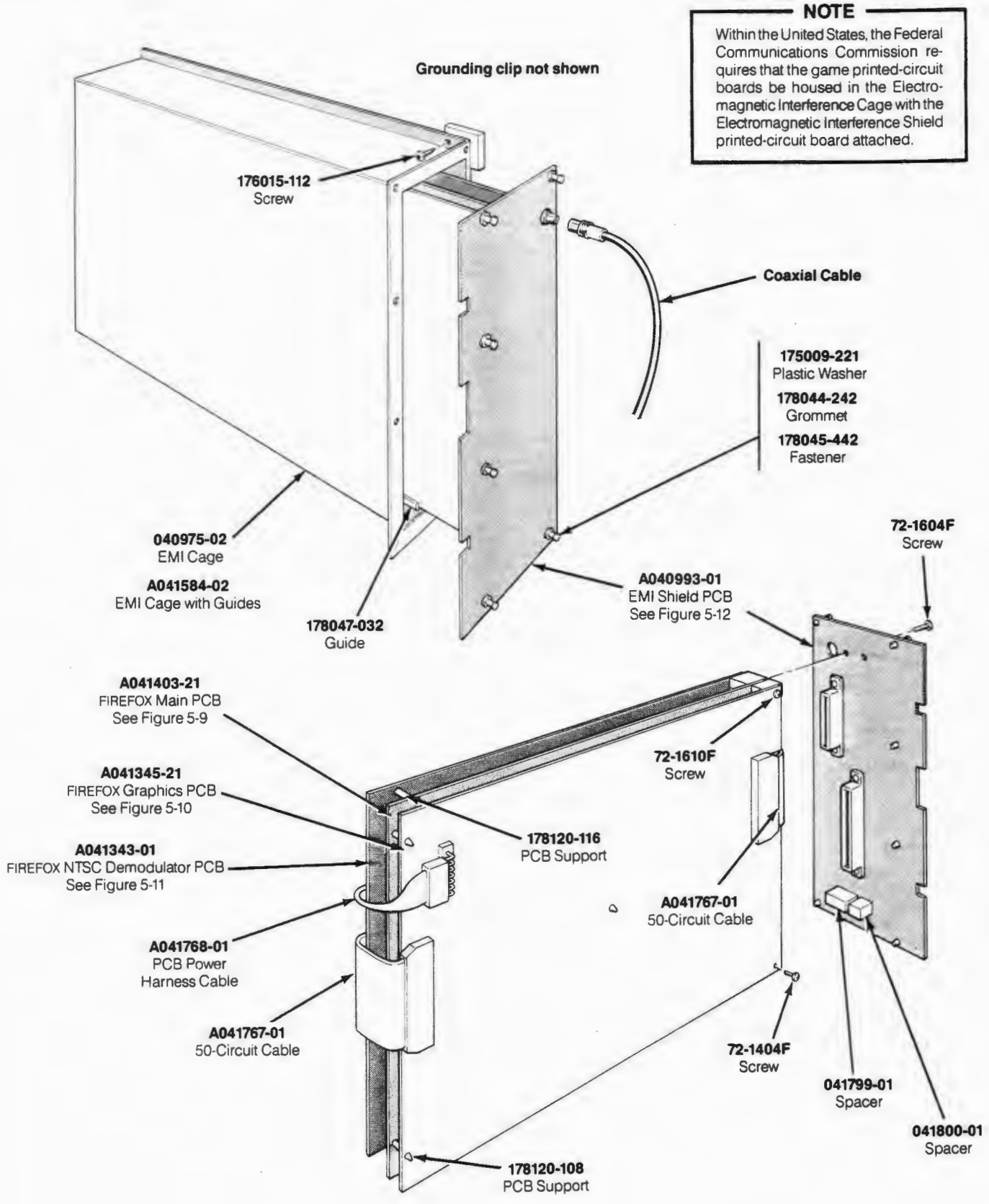


Figure 5-7 PCB Mounting Hardware—US

PCB Mounting Hardware—US
Parts List

Part No.	Description
A040993-01	EMI Shield PCB Assembly—includes
72-1404F	#4-40 × ¼-Inch Cross-Recessed Steel Screw
041799-01	Spacer
041800-01	Spacer
175009-221	Plastic Washer
178044-242	Grommet
178045-442	Snap-In Fastener
A041343-01	FIREFOX NTSC Demodulator PCB
A041345-21	FIREFOX Graphics PCB
A041403-21	FIREFOX Main PCB
A041584-02	EMI Cage with Guides
040975-02	EMI Cage
178047-032	16-Inch Snap-In PCB Guide (six required)
A041767-01	50-Circuit Ribbon Cable
A041768-01	PCB Power Harness Cable
A041768-02	PCB Power Harness Cable (connects Main PCB to Demodulator PCB) (not shown)
72-1604F	#6-32 × ¼-Inch Cross-Recessed Pan-Head Screw
72-1610F	#6-32 × ⅝-Inch Cross-Recessed Pan-Head Screw
175004-708	#8 Flat Fiber Washer (not shown)
176015-112	#10 × ¾-Inch Cross-Recessed Pan-Head Screw
178120-108	⅜-Inch PCB Support (located between the Graphics and the Main PCB)
178120-116	1-Inch PCB Support (located between the Main and the Demodulator PCB)
178149-607	Nylon Standoff (not shown)

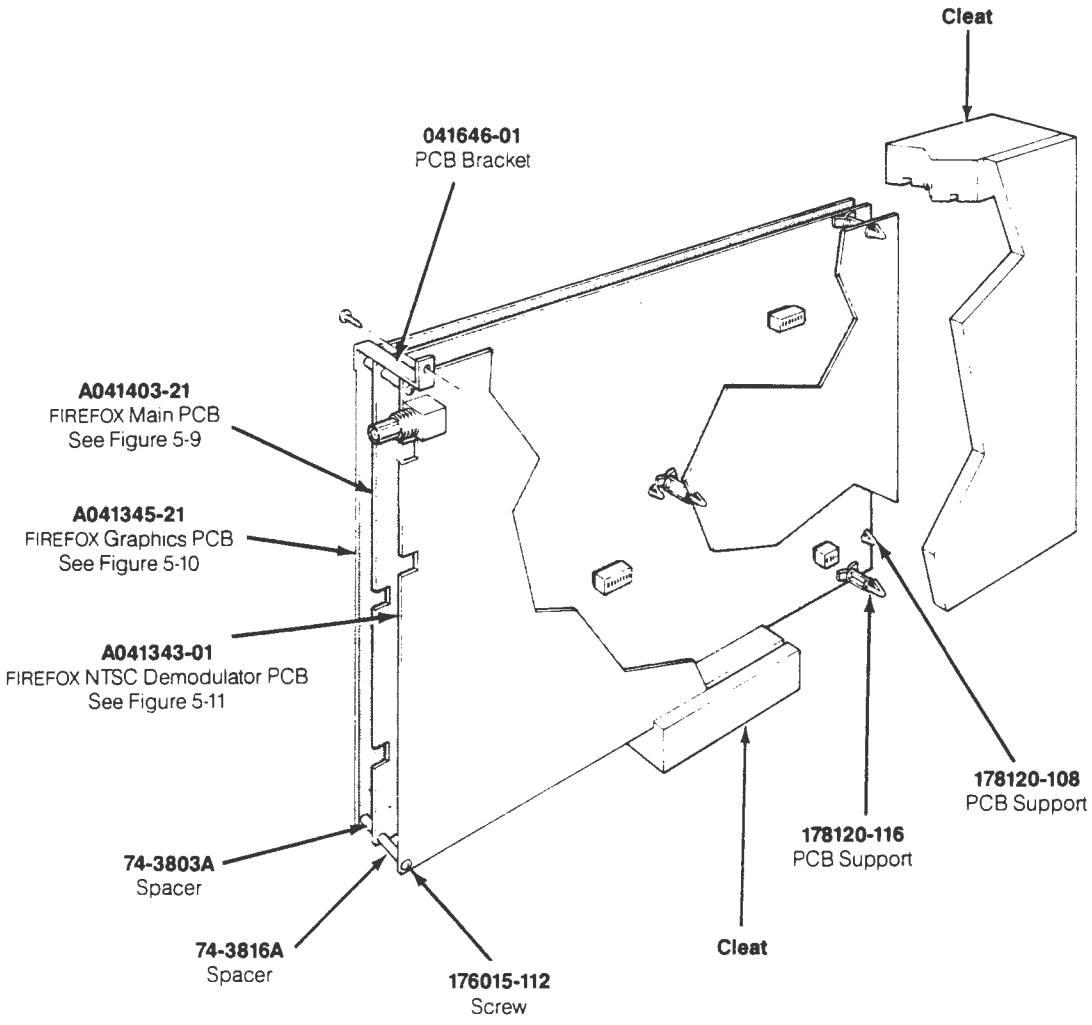


Figure 5-8 PCB Mounting Hardware—Ireland
Parts List

Part No.	Description
A041343-01	FIREFOX Demodulator PCB
A041345-21	FIREFOX Graphics PCB
A041403-21	FIREFOX Main PCB
74-3803A	¼-Inch Aluminum Spacer
74-3816A	1-Inch Aluminum Spacer
041646-01	PCB Bracket
178120-108	⅛-Inch PCB Support (located between the Graphics and the Main PCB)
178120-116	1-Inch PCB Support (located between the Main and the Demodulator PCB)
176015-112	#10 × ¼-Inch Cross-Recessed Pan-Head Screw

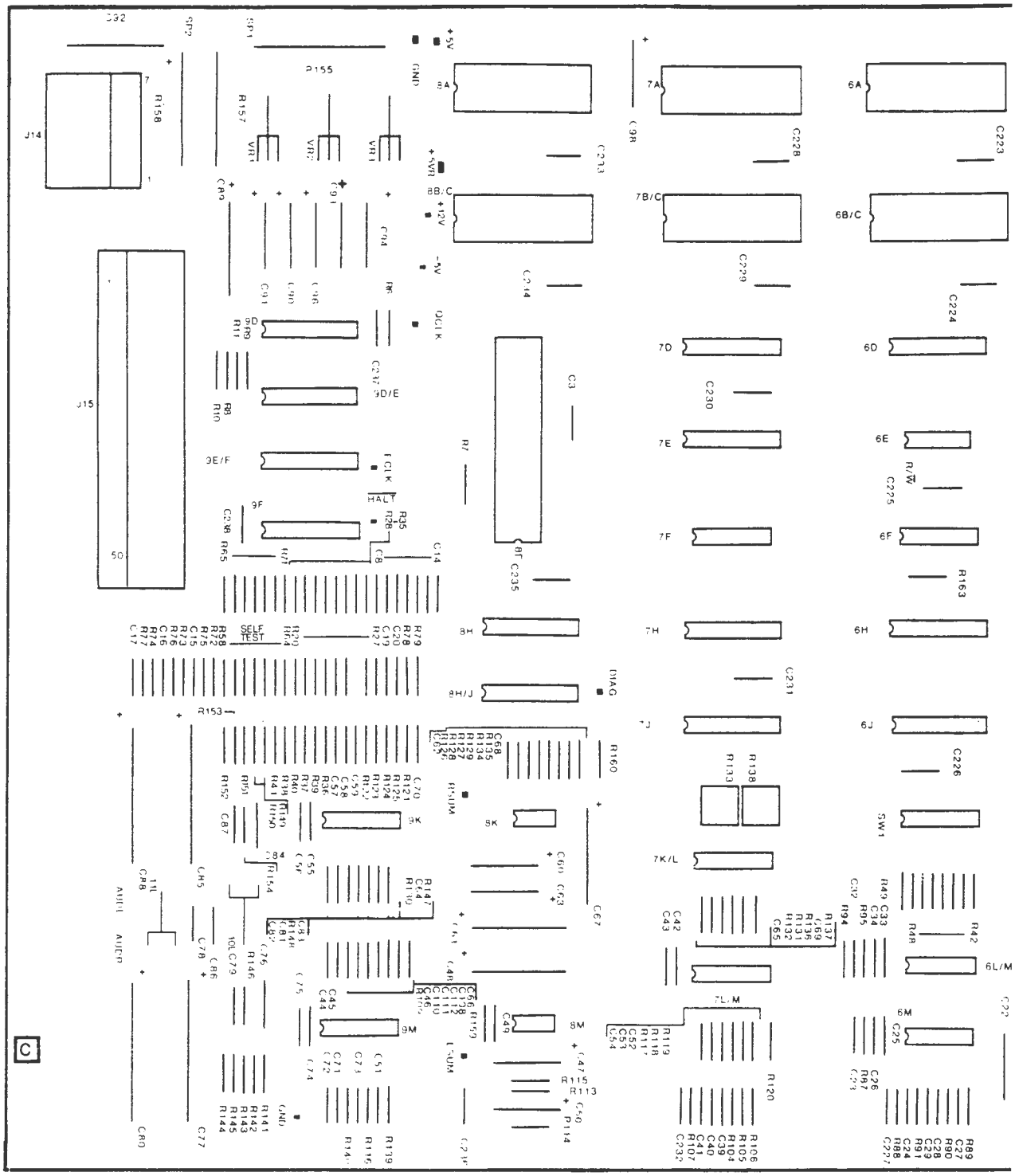


Figure 5-9 Main PCB Assembly
A041403-21 D

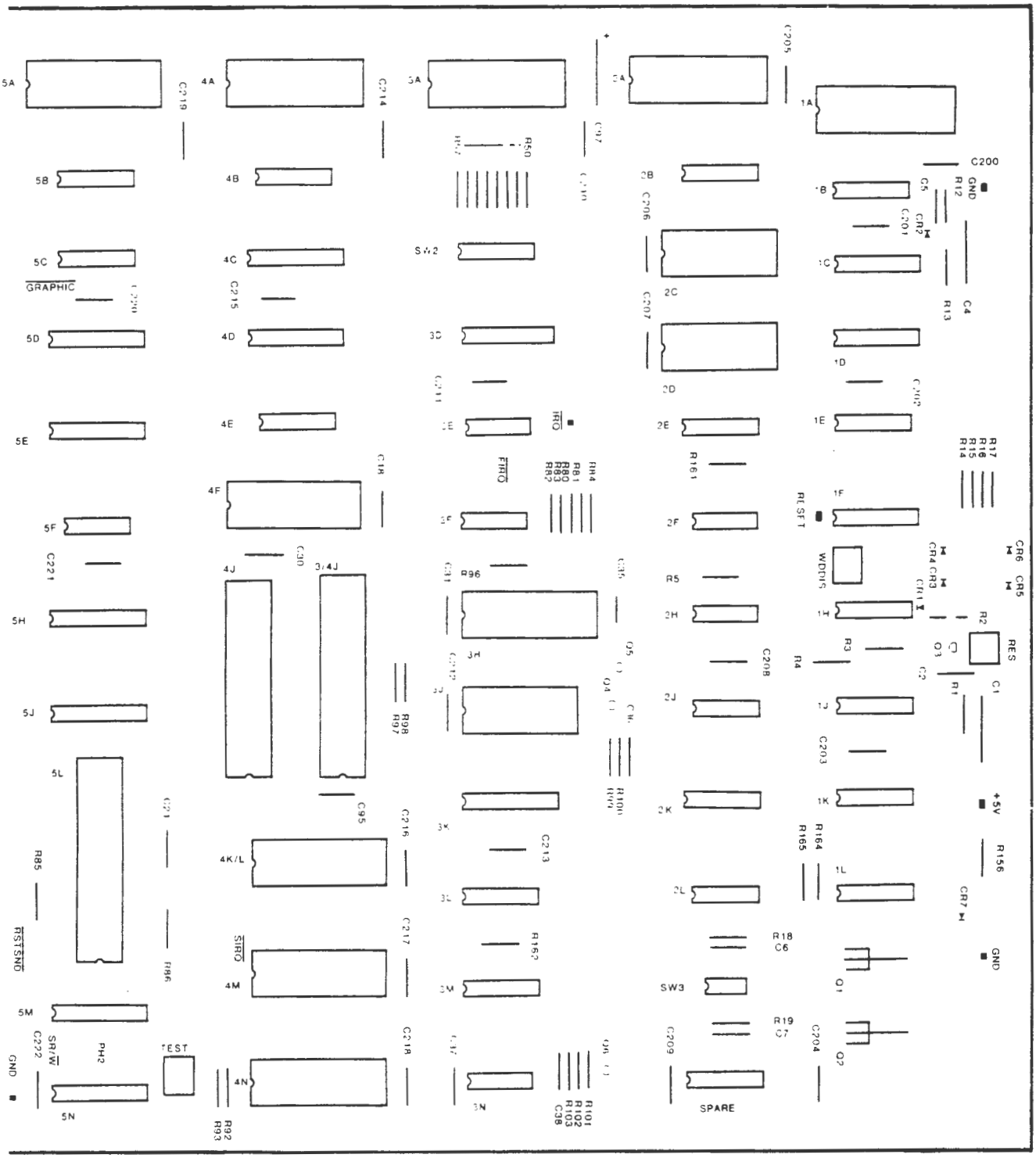


Figure 5-9 Main PCB Assembly, continued
A041403-21 D

Main PCB Assembly
Parts List

Designator	Description	Part No.
	Capacitors	
C1	10 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350106
C2, C3	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C4	4.7 µF, 50 V, Aluminum Electrolytic Axial-Lead Capacitor	24-500475
C5–C21	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C22	10 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350106
C23	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C24	0.001 µF, 50 V Ceramic Capacitor	122002-102
C25, C26	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C27–C29	0.001 µF, 50 V Ceramic Capacitor	122002-102
C30–C43	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C44–C46	0.0027 µF, ±10%, 50 V Ceramic Axial-Lead Capacitor	122015-272
C47	0.47 µF, 50 V Aluminum Electrolytic Axial-Lead Capacitor	124001-474
C48	100 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350107
C49	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C50	10 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350106
C51–C56	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C57–C59	0.0027 µF, ±10%, 50 V Ceramic Axial-Lead Capacitor	122015-272
C60	0.47 µF, 50 V Aluminum Electrolytic Axial-Lead Capacitor	124001-474
C61	100 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350107
C62	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C63	10 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350106
C64–C66	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C67	100 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350107
C68–C70	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C71–C73	0.0027 µF, ±10%, 50 V Ceramic Axial-Lead Capacitor	122015-272
C74, C75	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C76	0.22 µF, -20%, 25 V Ceramic Axial-Lead Capacitor	122004-224
C77	470 µF, 25 V, Aluminum Electrolytic Axial-Lead Capacitor	24-250477
C78, C79	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C80	470 µF, 25 V, Aluminum Electrolytic Axial-Lead Capacitor	24-250477
C81–C83	0.0027 µF, ±10%, 50 V Ceramic Axial-Lead Capacitor	122015-272
C84	0.22 µF, -20%, 25 V Ceramic Axial-Lead Capacitor	122004-224
C85	470 µF, 25 V, Aluminum Electrolytic Axial-Lead Capacitor	24-250477
C86, C87	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C88	470 µF, 25 V, Aluminum Electrolytic Axial-Lead Capacitor	24-250477
C89	100 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350107
C90, C91	10 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350106
C92	100 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350107
C93, C94	10 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350106
C95	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104
C96	10 µF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	24-350106
C97, C98	4.7 µF, 50 V, Aluminum Electrolytic Axial-Lead Capacitor	24-500475
C200–C239	0.1 µF, +80% -20%, 50 V Ceramic Capacitor	122002-104

(continued on next page)

Main PCB Assembly
Parts List, continued

Designator	Description	Part No.
	Diodes	
CR1, CR2	Type-1N4001, 50 V Rectifier Diode	31-1N4001
CR3–CR7	Type-MV5053, Red, Light-Emitting Diode	38-MV5053
	Integrated Circuits	
1A	Programmed EPROM Integrated Circuit	136026-108
1B	Type-74S260 Integrated Circuit	37-74S260
1C	Non-Volatile RAM Integrated Circuit	137288-001
1D	Non-Volatile RAM Integrated Circuit	137288-001
1E	Type-74LS02 Integrated Circuit	37-74LS02
1F	Type-74LS259 Integrated Circuit	37-74LS259
1H	Type-74LS14 Integrated Circuit	37-74LS14
1J	Type-7407 Integrated Circuit	37-7407
1K	Type-74LS393 Integrated Circuit	37-74LS393
1L	Type-74LS393 Integrated Circuit	37-74LS393
2A	Programmed EPROM Integrated Circuit	136026-107
2B	Type-74LS139 Integrated Circuit	37-74LS139
2C	Static RAM Integrated Circuit	137211-001
2D	Static RAM Integrated Circuit	137211-001
2E	Type-74LS138 Integrated Circuit	137177-001
2F	Type-74LS74 Integrated Circuit	37-74LS74
2H	Type-74LS00 Integrated Circuit	37-74LS00
2J	Type-74LS00 Integrated Circuit	37-74LS00
2K	Type-74LS139 Integrated Circuit	37-74LS139
2L	Type-74LS02 Integrated Circuit	37-74LS02
3/4J	Custom Integrated Circuit	137324-1221
3A	Programmed EPROM Integrated Circuit	136026-106
3D–7D	Type-74LS244 Integrated Circuit	37-74LS244
3E	Type-74LS74 Integrated Circuit	37-74LS74
3F	Type-74LS04 Integrated Circuit	37-74LS04
3H	Custom Integrated Circuit	137308-001
3J	Static RAM Integrated Circuit	137211-001
3K	Type-74LS245 Integrated Circuit	37-74LS245
3L	Type-74LS138 Integrated Circuit	137177-001
3M	Type-74LS163A Integrated Circuit	37-74LS163A
3N	Type-74C04 Integrated Circuit	137309-001
4A	Programmed EPROM Integrated Circuit	136026-105
4B	Type-74LS138 Integrated Circuit	137177-001
4C	Type-74LS244 Integrated Circuit	37-74LS244
4E	Type-74LS138 Integrated Circuit	137177-001
4F	Analog/Digital Converter Integrated Circuit	137243-001
4J	Type-6532A Integrated Circuit	90-6018
4K/L	Programmed EPROM Integrated Circuit	136026-112
4M	Programmed EPROM Integrated Circuit	136026-113
4N	Programmed EPROM Integrated Circuit	136026-114

(continued on next page)

Main PCB Assembly
Parts List, continued

Designator	Description	Part No.
5A	Programmed EPROM Integrated Circuit	136026-104
5B	Type-74LS138 Integrated Circuit	137177-001
5C	Type-74S00 Integrated Circuit	37-74S00
5E	Type-74LS374 Integrated Circuit	13-74LS374
5F	Type-74LS74 Integrated Circuit	37-74LS74
5H, 6H	Type-74LS374 Integrated Circuit	13-74LS374
5J	Type-74LS374 Integrated Circuit	13-74LS374
5L	Type-6502A Integrated Circuit	90-6013
5M	Type-74LS244 Integrated Circuit	37-74LS244
5N	Type-74LS244 Integrated Circuit	37-74LS244
6A	Programmed EPROM Integrated Circuit	136026-103
6B/C	Programmed EPROM Integrated Circuit	136026-111
6E	Type-74LS04 Integrated Circuit	37-74LS04
6F	Type-74LS138 Integrated Circuit	137177-001
6J, 7J	Type-74LS244 Integrated Circuit	37-74LS244
6L/M	Quad Op-Amp Integrated Circuit	37-347
6M	Quad Op-Amp Integrated Circuit	37-347
7A	Programmed EPROM Integrated Circuit	136026-102
7B/C	Programmed EPROM Integrated Circuit	136026-110
7E	Type-74LS244 Integrated Circuit	37-74LS244
7F	Type-74LS259 Integrated Circuit	37-74LS259
7H, 8H	Type-74LS244 Integrated Circuit	37-74LS244
7L/M	Quad Op-Amp Integrated Circuit	37-347
8A	Programmed EPROM Integrated Circuit	136026-101
8B/C	Programmed EPROM Integrated Circuit	136026-109
8E	Microprocessor Integrated Circuit	137249-120
8H/J	Type-74LS244 Integrated Circuit	37-74LS244
8K	Analog Delay Line Integrated Circuit	137310-001
8M	Analog Delay Line Integrated Circuit	137310-001
9D	Type-74LS244 Integrated Circuit	37-74LS244
9D/E	Type-74LS245 Integrated Circuit	37-74LS245
9E/F	Type-74LS244 Integrated Circuit	37-74LS244
9F	Type-74LS244 Integrated Circuit	37-74LS244
9K	Quad Op-Amp Integrated Circuit	37-347
9M	Quad Op-Amp Integrated Circuit	37-347
10L	Type-2002 Integrated Circuit	137151-002
11L	Type-2002 Integrated Circuit	137151-002
VR1	Type-7812 Integrated Circuit	37-7812
VR2	Type-7805 Integrated Circuit	37-7805
VR3	Type-7905 Integrated Circuit	37-7905
	Resistors	
R1	1 kΩ, ±5%, ¼ W Resistor	110000-102
R2, R3	470 Ω, ±5%, ¼ W Resistor	110000-471
R4	4.7 kΩ, ±5%, ¼ W Resistor	110000-472
R5	10 kΩ, ±5%, ¼ W Resistor	110000-103

(continued on next page)

Main PCB Assembly
Parts List, continued

Designator	Description	Part No.
R6, R7	1 kΩ, ±5%, ¼ W Resistor	110000-102
R8, R9	220 Ω, ±5%, ¼ W Resistor	110000-221
R10, R11	330 Ω, ±5%, ¼ W Resistor	110000-331
R12	22 kΩ, ±5%, ¼ W Resistor	110000-223
R13	10 kΩ, ±5%, ¼ W Resistor	110000-103
R14–R17	330 Ω, ±5%, ¼ W Resistor	110000-331
R18, R19	1 kΩ, ±5%, ¼ W Resistor	110000-102
R20–R27	220 Ω, ±5%, ¼ W Resistor	110000-221
R28–R35	330 Ω, ±5%, ¼ W Resistor	110000-331
R36–R38	220 Ω, ±5%, ¼ W Resistor	110000-221
R39–R41	330 Ω, ±5%, ¼ W Resistor	110000-331
R42–R57	10 kΩ, ±5%, ¼ W Resistor	110000-103
R58–R64	470 Ω, ±5%, ¼ W Resistor	110000-471
R65–R71	1 kΩ, ±5%, ¼ W Resistor	110000-102
R72–R74	470 Ω, ±5%, ¼ W Resistor	110000-471
R75–R77	1 kΩ, ±5%, ¼ W Resistor	110000-102
R78, R79	100 Ω, ±5%, ¼ W Resistor	110000-101
R80–R84	4.7 kΩ, ±5%, ¼ W Resistor	110000-472
R85, R86	1 kΩ, ±5%, ¼ W Resistor	110000-102
R87	100 kΩ, ±5%, ¼ W Resistor	110000-104
R88–R91	1 kΩ, ±5%, ¼ W Resistor	110000-102
R92, R93	10 kΩ, ±5%, ¼ W Resistor	110000-103
R94	1.8 kΩ, ±5%, ¼ W Resistor	110000-182
R95	100 kΩ, ±5%, ¼ W Resistor	110000-104
R96, R97	10 kΩ, ±5%, ¼ W Resistor	110000-103
R98	3.3 kΩ, ±5%, ¼ W Resistor	110000-332
R99	1 kΩ, ±5%, ¼ W Resistor	110000-102
R100	3.3 kΩ, ±5%, ¼ W Resistor	110000-332
R101	10 kΩ, ±5%, ¼ W Resistor	110000-103
R102	3.3 kΩ, ±5%, ¼ W Resistor	110000-332
R103	1 kΩ, ±5%, ¼ W Resistor	110000-102
R104, R105	47 kΩ, ±5%, ¼ W Resistor	110000-473
R106	6.8 kΩ, ±5%, ¼ W Resistor	110000-682
R107–R109	12 kΩ, ±5%, ¼ W Resistor	110000-123
R110	47 kΩ, ±5%, ¼ W Resistor	110000-473
R111	22 kΩ, ±5%, ¼ W Resistor	110000-223
R112	47 kΩ, ±5%, ¼ W Resistor	110000-473
R113	68 kΩ, ±5%, ¼ W Resistor	110000-683
R114	12 kΩ, ±5%, ¼ W Resistor	110000-123
R115	1.5 kΩ, ±5%, ¼ W Resistor	110000-152
R116	470 kΩ, ±5%, ¼ W Resistor	110000-474
R117, R118	47 kΩ, ±5%, ¼ W Resistor	110000-473
R119	15 kΩ, ±5%, ¼ W Resistor	110000-153
R120–R122	12 kΩ, ±5%, ¼ W Resistor	110000-123
R123	47 kΩ, ±5%, ¼ W Resistor	110000-473
R124	22 kΩ, ±5%, ¼ W Resistor	110000-223

(continued on next page)

Main PCB Assembly
Parts List, continued

Designator	Description	Part No.
R125	47 kΩ, ±5%, ¼ W Resistor	110000-473
R126	100 Ω, ±5%, ¼ W Resistor	110000-101
R127	68 kΩ, ±5%, ¼ W Resistor	110000-683
R128	12 kΩ, ±5%, ¼ W Resistor	110000-123
R129	1.5 kΩ, ±5%, ¼ W Resistor	110000-152
R130	470 kΩ, ±5%, ¼ W Resistor	110000-474
R131	100 kΩ, ±5%, ¼ W Resistor	110000-104
R132	4.7 kΩ, ±5%, ¼ W Resistor	110000-472
R133	10 kΩ Horizontal Trimming Potentiometer	119002-103
R134	10 kΩ, ±5%, ¼ W Resistor	110000-103
R135	2.7 kΩ, ±5%, ¼ W Resistor	110000-272
R136	100 kΩ, ±5%, ¼ W Resistor	110000-104
R137	4.7 kΩ, ±5%, ¼ W Resistor	110000-472
R138	10 kΩ Horizontal Trimming Potentiometer	119002-103
R139, R140	12 kΩ, ±5%, ¼ W Resistor	110000-123
R141	10 kΩ, ±5%, ¼ W Resistor	110000-103
R142	22 kΩ, ±5%, ¼ W Resistor	110000-223
R143	1 kΩ, ±5%, ¼ W Resistor	110000-102
R144	10 Ω, ±5%, ¼ W Resistor	110000-100
R145	220 Ω, ±5%, ¼ W Resistor	110000-221
R146	1 Ω, ±5%, ¼ W Resistor	110000-010
R147, R148	12 kΩ, ±5%, ¼ W Resistor	110000-123
R149	10 kΩ, ±5%, ¼ W Resistor	110000-103
R150	22 kΩ, ±5%, ¼ W Resistor	110000-223
R151	1 kΩ, ±5%, ¼ W Resistor	110000-102
R152	10 Ω, ±5%, ¼ W Resistor	110000-100
R153	220 kΩ, ±5%, ¼ W Resistor	110000-221
R154	1 Ω, ±5%, ¼ W Resistor	110000-010
R155	62 Ω, ±5%, 5 W Resistor	116001-620
R156	150 Ω, ±5%, ¼ W Resistor	110000-151
R157, R158	220 Ω, ±5%, 3 W Resistor	110022-221
R159	100 Ω, ±5%, ¼ W Resistor	110000-101
R160	10 kΩ, ±5%, ¼ W Resistor	110000-103
R161–R163	1 kΩ, ±5%, ¼ W Resistor	110000-102
R165	330 Ω, ±5%, ¼ W Resistor	110000-331
	Sockets	
1A–8A	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
1C	18-Contact, Medium-Insertion-Force IC Socket	79-42C18
1D	18-Contact, Medium-Insertion-Force IC Socket	79-42C18
2C	24-Contact, Medium-Insertion-Force IC Socket	79-42C24
2D	24-Contact, Medium-Insertion-Force IC Socket	79-42C24
3/4J	40-Contact, Medium-Insertion-Force IC Socket	79-42C40
3H	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
3J	24-Contact, Medium-Insertion-Force IC Socket	79-42C24

(continued on next page)

Main PCB Assembly
Parts List, continued

Designator	Description	Part No.
4F	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
4J	40-Contact, Medium-Insertion-Force IC Socket	79-42C40
4K/L	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
4M	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
4N	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
5L	40-Contact, Medium-Insertion-Force IC Socket	79-42C40
6B/C	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
7B/C	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
8B/C	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
8E	40-Contact, Medium-Insertion-Force IC Socket	79-42C40
	Transistors	
Q1, Q2	Type-2N6044 Transistor	34-2N6044
Q3	Type-2N3904 Transistor	34-2N3904
Q4	Type-2N3906 Transistor	34-2N3906
Q5	Type-2N3904 Transistor	34-2N3904
Q6	Type-2N3906 Transistor	34-2N3906
	Miscellaneous	
SW1, SW2	8-Toggle DIP Switch (Acceptable substitute is part no. 66-118P1T)	160031-008
SW3	4-Toggle DIP Switch	66-114P1T
	7-Circuit Header Connector	179165-007
	Nylon Snap-In Fastener	81-4302
	Test Point (Acceptable substitute is part no. 020670-001)	179051-002
	50-Circuit, 4-Wall Header, Right-Angle Connector	179186-001

Note: See Cabinet-Mounted Assemblies Parts List for part number of 50-circuit ribbon cable assembly.

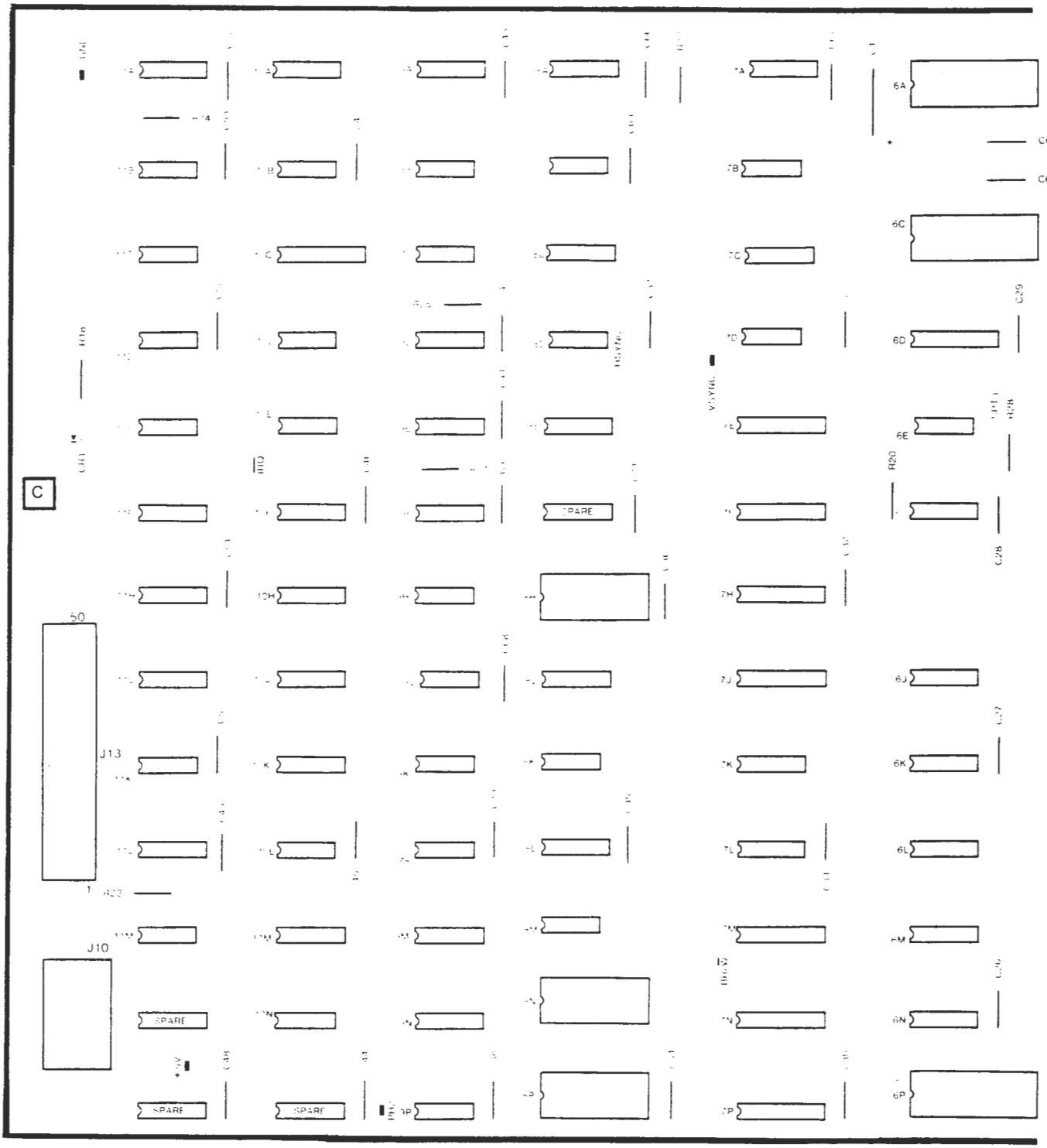


Figure 5-10 Graphics PCB Assembly
A041345-21 D

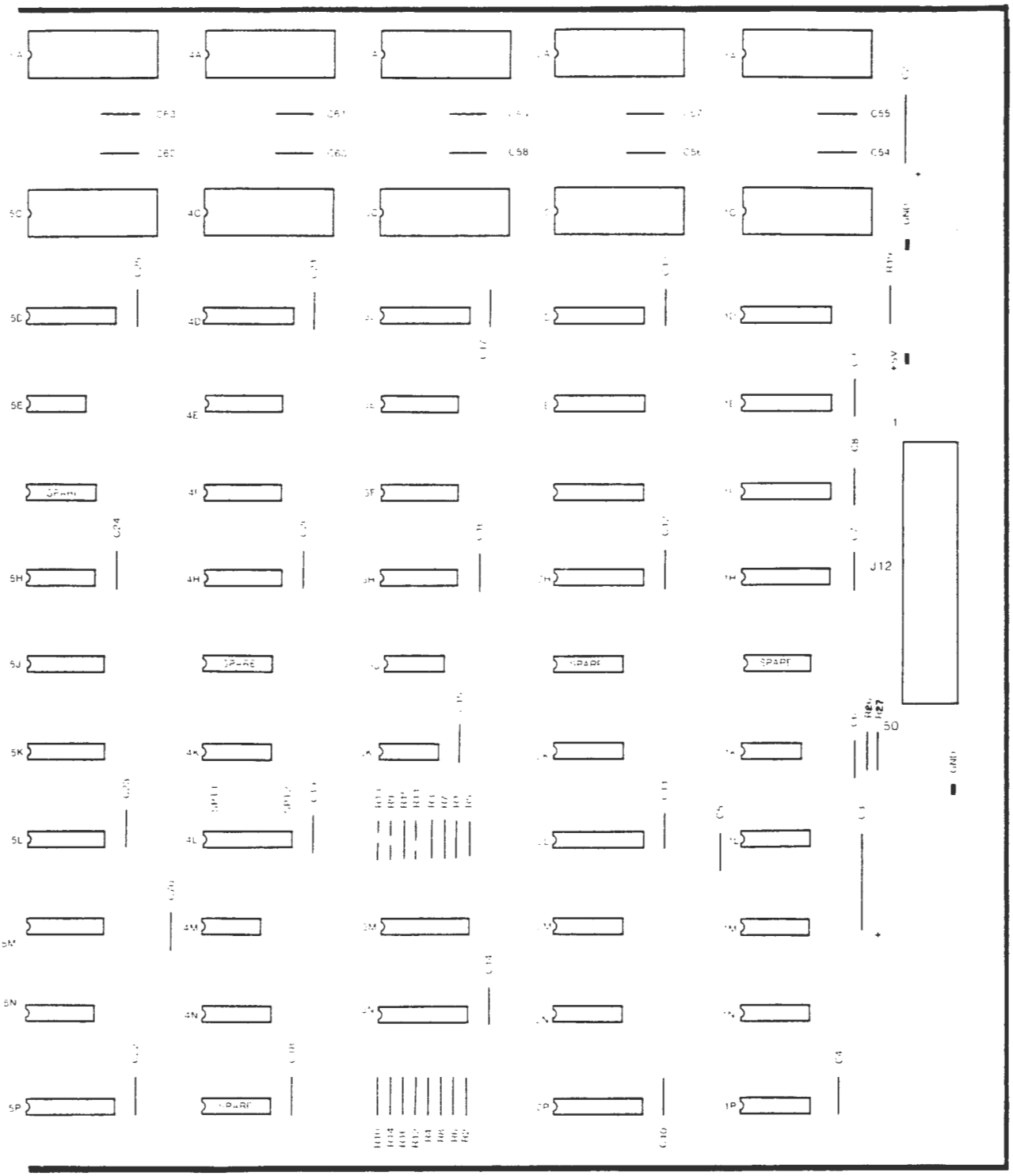


Figure 5-10 Graphics PCB Assembly, continued
A041345-01 D

Graphics PCB Assembly
Parts List

Designator	Description	Part No.
	Capacitors	
C1, C2	4.7 μF, 35 V, Aluminum Electrolytic Axial-Lead Capacitor	124000-475
C3	100 μF, 50 V, Aluminum Electrolytic Axial-Lead Capacitor	124001-107
C4–C72	0.1 μF, +80% -20%, 50 V Ceramic Capacitor	122002-104
	Integrated Circuits	
1D–6D	Type-74LS299 Integrated Circuit	137180-001
1E	Type-74S374 Integrated Circuit	137206-001
1F	Type-74S374 Integrated Circuit	137206-001
1H	Type-74S374 Integrated Circuit	137206-001
1K	Type-74S04 Integrated Circuit	37-74S04
1L	Type-74LS153 Integrated Circuit	37-74LS153
1M	Type-74LS153 Integrated Circuit	37-74LS153
1N	Type-74LS153 Integrated Circuit	37-74LS153
1P	Type-74LS153 Integrated Circuit	37-74LS153
2E	Type-74LS245 Integrated Circuit	37-74LS245
2F	Type-74LS245 Integrated Circuit	37-74LS245
2H	Type-74LS245 Integrated Circuit	37-74LS245
2K	Type-74S157 Integrated Circuit	37-74S157
2L	Type-74LS240 Integrated Circuit	137251-001
2M	Type-74LS158 Integrated Circuit	137203-001
2N	Type-74LS158 Integrated Circuit	137203-001
2P	Type-74LS374 Integrated Circuit	37-74LS374
3E	Static RAM Integrated Circuit	137199-001
3F	Static RAM Integrated Circuit	137199-001
3H	Static RAM Integrated Circuit	137199-001
3J	Type-74LS74 Integrated Circuit	37-74LS74
3K	Type-74S260 Integrated Circuit	37-74S260
3M	Type-74S374 Integrated Circuit	137206-001
3N	Type-74S374 Integrated Circuit	137206-001
4E	Static RAM Integrated Circuit	137199-001
4F	Static RAM Integrated Circuit	137199-001
4H	Static RAM Integrated Circuit	137199-001
4K	Type-74S157 Integrated Circuit	37-74S157
4L	Type-74LS240 Integrated Circuit	137251-001
4M	Type-74S08 Integrated Circuit	37-74S08
4N	Type-74LS175 Integrated Circuit	37-74LS175
5E	Type-74LS32 Integrated Circuit	37-74LS32
5H	Type-74S161 Integrated Circuit	137287-001
5J	Static RAM Integrated Circuit	137199-002
5K	Static RAM Integrated Circuit	137199-002
5L	Static RAM Integrated Circuit	137199-002
5M	Static RAM Integrated Circuit	137199-002
5N	Type-74LS157 Integrated Circuit	37-74LS157
5P	Type-74S374 Integrated Circuit	137206-001
6E	Type-74S32 Integrated Circuit	37-74S32
6F	Type-74S175 Integrated Circuit	37-74S175

(continued on next page)

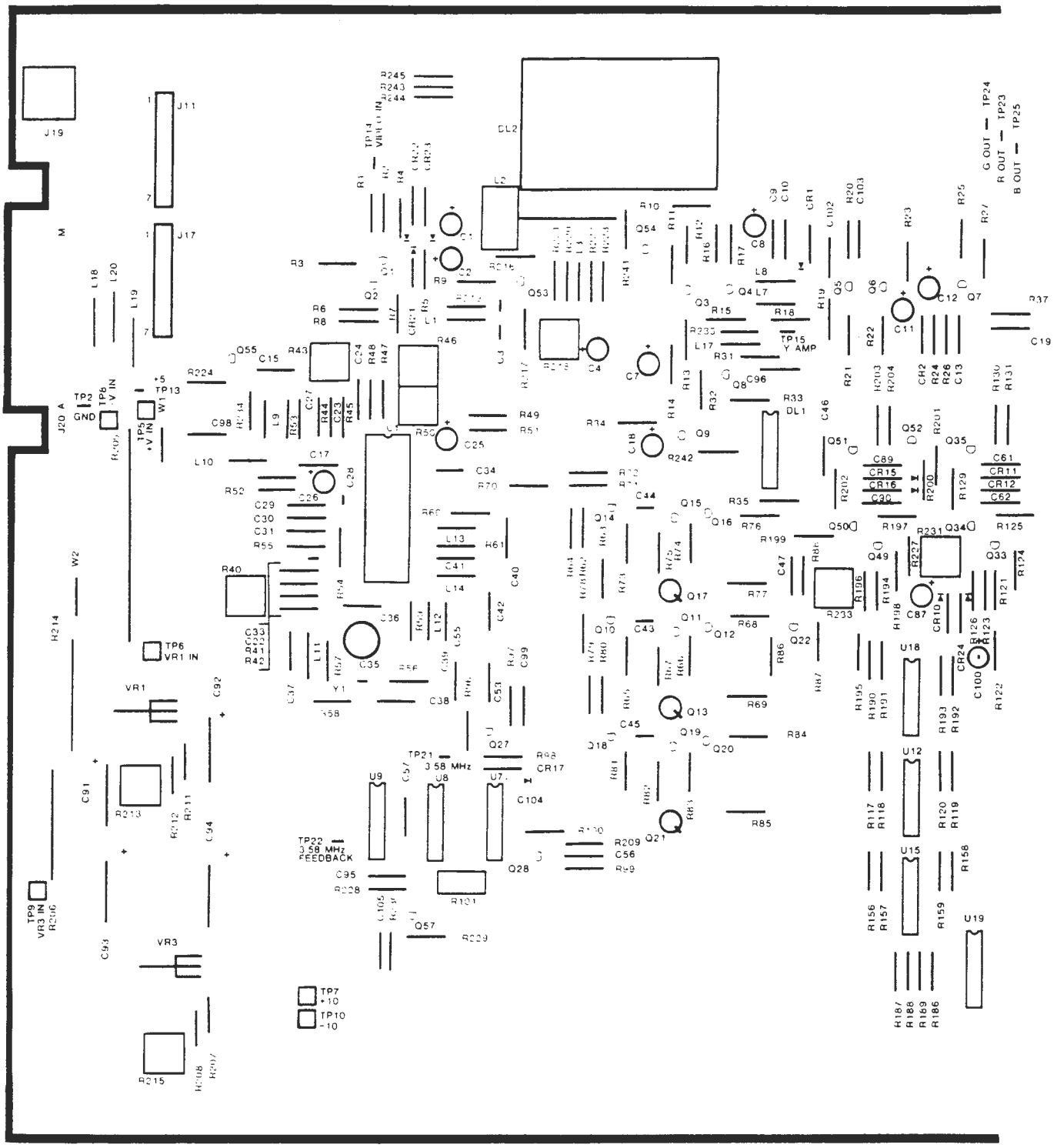
Graphics PCB Assembly
Parts List, continued

Designator	Description	Part No.
6J	Type-74S161 Integrated Circuit	137287-001
6K	Type-74S161 Integrated Circuit	137287-001
6L	Type-74S161 Integrated Circuit	137287-001
6M	Type-74S161 Integrated Circuit	137287-001
6N	Type-74S161 Integrated Circuit	137287-001
7A	Type-74LS163 Integrated Circuit	137274-001
7B	Type-74LS86 Integrated Circuit	37-74LS86
7C	Type-74LS174 Integrated Circuit	37-74LS174
7D	Type-74LS08 Integrated Circuit	37-74LS08
7E	Type-74LS374 Integrated Circuit	37-74LS374
7F	Type-74LS374 Integrated Circuit	37-74LS374
7H	Type-74LS374 Integrated Circuit	37-74LS374
7J	Type-74LS374 Integrated Circuit	37-74LS374
7K	Type-74S283 Integrated Circuit	137204-001
7L	Type-74S283 Integrated Circuit	137204-001
7M	Type-74LS245 Integrated Circuit	37-74LS245
7N	Type-74LS245 Integrated Circuit	37-74LS245
7P	Type-74S374 Integrated Circuit	137206-001
8A	Type-74LS163 Integrated Circuit	137274-001
8B	Type-74S74 Integrated Circuit	37-74S74
8C	Type-74LS109 Integrated Circuit	37-74LS109
8D	Type-7414 Integrated Circuit	37-7414
8E	Type-74LS74 Integrated Circuit	37-74LS74
8J	Type-74LS138 Integrated Circuit	137177-001
8K	Type-74LS20 Integrated Circuit	37-74LS20
8L	Type-74LS157 Integrated Circuit	37-74LS157
8M	Type-74LS32 Integrated Circuit	37-74LS32
9A	Type-74LS163 Integrated Circuit	137274-001
9B	Type-74S04 Integrated Circuit	37-74S04
9C	Type-74LS10 Integrated Circuit	37-74LS10
9D	Type-74LS163A Integrated Circuit	37-74LS163A
9E	Type-74S163 Integrated Circuit	137274-001
9F	Type-74LS163A Integrated Circuit	37-74LS163A
9H	Type-74LS86 Integrated Circuit	37-74LS86
9J	Type-74LS00 Integrated Circuit	37-74LS00
9K	Type-74LS08 Integrated Circuit	37-74LS08
9L	Type-74LS10 Integrated Circuit	37-74LS10
9M	Type-74LS157 Integrated Circuit	37-74LS157
9N	Type-74LS109 Integrated Circuit	37-74LS109
9P	Type-74S74 Integrated Circuit	37-74S74
10A	Type-74LS163 Integrated Circuit	137274-001
10B	Type-74LS11 Integrated Circuit	137149-001
10C	Type-74LS273 Integrated Circuit	37-74LS273
10D	Type-74S02 Integrated Circuit	37-74S02
10E	Type-74S00 Integrated Circuit	37-74S00
10F	Type-74S161 Integrated Circuit	137287-001

(continued on next page)

Graphics PCB Assembly
Parts List, continued

Designator	Description	Part No.
10H	Type-74S139 Integrated Circuit	37-74S139
10J	Type-74LS157 Integrated Circuit	37-74LS157
10K	Type-74LS157 Integrated Circuit	37-74LS157
10L	Type-74LS32 Integrated Circuit	37-74LS32
10M	Type-74LS157 Integrated Circuit	37-74LS157
10N	Type-74LS04 Integrated Circuit	37-74LS04
11A	Type-74LS163 Integrated Circuit	137274-001
11B	Type-74LS74 Integrated Circuit	37-74LS74
11C	Type-74LS00 Integrated Circuit	37-74LS00
11D	Type-74S08 Integrated Circuit	37-74S08
11E	Type-74LS74 Integrated Circuit	37-74LS74
11F	Type-74LS157 Integrated Circuit	37-74LS157
11H	Type-74S161 Integrated Circuit	137287-001
11J	Type-74LS157 Integrated Circuit	37-74LS157
11K	Type-74S04 Integrated Circuit	37-74S04
11L	Type-74S161 Integrated Circuit	137287-001
11M	Type-74LS74 Integrated Circuit	37-74LS74
	Resistors	
R1–R16	1 kΩ, ±5%, ¼ W Resistor	110000-102
R18	150 kΩ, ±5%, ¼ W Resistor	110000-151
R19–R25	1 kΩ, ±5%, ¼ W Resistor	110000-102
R27	150 kΩ, ±5%, ¼ W Resistor	110000-151
R28	0 Ω Resistor	110005-001
	Sockets	
1A	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
1C	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
2A	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
2C	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
3A	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
3C	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
4A	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
4C	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
5A	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
5C	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
6A	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
6C	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
6P	28-Contact, Medium-Insertion-Force IC Socket	79-42C28
8H	24-Contact, Medium-Insertion-Force IC Socket	79-42C24
8N	24-Contact, Medium-Insertion-Force IC Socket	79-42C24
8P	24-Contact, Medium-Insertion-Force IC Socket	79-42C24
	Miscellaneous	
CR1	Type-MV5053, Red Light-Emitting Diode	38-MV5053
J10	2-Circuit, Right-Angle Connector Header	179165-002
J10	4-Circuit, Right-Angle Connector Header	179165-004
J12, J13	50-Pin, Right-Angle Ribbon	179186-001
	Test Point (Acceptable substitute is part no. 020670-001)	179051-002



*National Television Service Committee

Figure 5-11 NTSC* Demodulator PCB Assembly
A041343-01 E

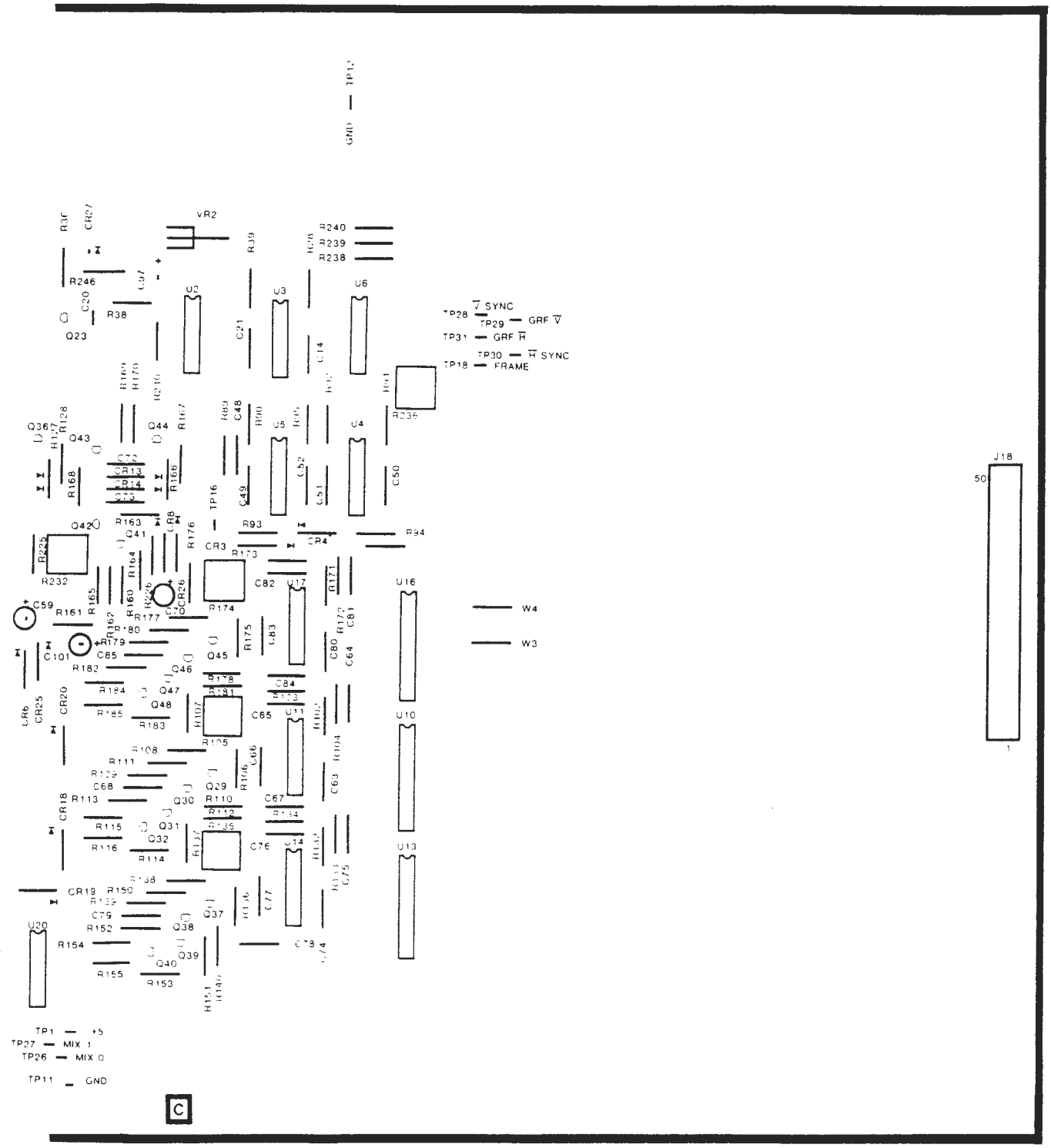


Figure 5-11 NTSC* Demodulator PCB Assembly, continued
A041343-01 E

NTSC Demodulator PCB Assembly
Parts List

Designator	Description	Part No.
	Capacitors	
C1	100 µF, 10 V, Aluminum Electrolytic Radial-Lead Capacitor	123013-107
C2	100 µF, 10 V, Aluminum Electrolytic Radial-Lead Capacitor	123013-107
C3	1000 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-102
C4	1.0 µF, 50 V, Aluminum Electrolytic Radial-Lead Capacitor	123001-105
C7, C8	100 µF, 10 V, Aluminum Electrolytic Radial-Lead Capacitor	123013-107
C9	270 pF, ±10%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-271
C10	330 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-331
C11, C12	0.22 µF, 100 V Polyester Radial-Lead Capacitor	21-101224
C13	3300 pF, ±10%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-332
C14	1000 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-102
C15	51 pF, ±10%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-510
C17	220 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-221
C18	10 µF, 50 V, Aluminum Electrolytic Radial-Lead Capacitor	123001-106
C19	100 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-101
C20	0.022 µF, 100 V, Polyester Radial-Lead Capacitor	21-101223
C21	470 pF, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-471
C22–C24	0.01 µF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C25, C26	1.0 µF, 50 V, Aluminum Electrolytic Radial-Lead Capacitor	123001-105
C27	270 pF, ±10%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-271
C28	1.0 µF, ±10%, 50 V Minimum, Radial-Lead Ceramic Capacitor	121015-105
C29–C31	0.01 µF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C32	1.0 µF, ±10%, 50 V Minimum, Radial-Lead Ceramic Capacitor	121015-105
C33	0.01 µF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C34	0.47 µF, 100 V, Polyester Radial-Lead Capacitor	21-101474
C35	5.5–40 pF, PC Mount, Variable Ceramic Disc Capacitor	121026-001
C37	100 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-101
C38	150 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-151
C39	75 pF, ±10%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-750
C40	120 pF, ±10%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-121
C41	330 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-331
C42	1000 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-102
C43–C45	0.1 µF, 100 V Polyester Radial-Lead Capacitor	21-101104
C46	0.01 µF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C47, C48	220 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-221
C49	470 pF,100 V, NPO Axial-Lead Ceramic Capacitor	122016-471
C50	220 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-221
C51	1000 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-102
C52	180 pF, ±10%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-181
C53	220 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-221
C56	0.05 µF, +80% -20%, 25 V Ceramic Capacitor	121002-503
C57	10 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-100
C59	100 µF, 10 V, Aluminum Electrolytic Radial-Lead Capacitor	123013-107
C61, C62	0.01 µF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C63, C64	0.1 µF, ±10%, 25 V Ceramic Capacitor	122006-104

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NTSC Demodulator PCB Assembly
Parts List, continued

Designator	Description	Part No.
C65	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C66	0.1 μF, ±10%, 25 V Ceramic Capacitor	122006-104
C67	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C68	15 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-150
C70	100 μF, 10 V, Aluminum Electrolytic Radial-Lead Capacitor	123013-107
C72, C73	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C74, C75	0.1 μF, ±10%, 25 V Ceramic Capacitor	122006-104
C76	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C77	0.1 μF, ±10%, 25 V Ceramic Capacitor	122006-104
C78	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C79	15 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-150
C80, C81	0.1 μF, ±10%, 25 V Ceramic Capacitor	122006-104
C82	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C83	0.1 μF, ±10%, 25 V Ceramic Capacitor	122006-104
C84	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C85	15 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-150
C87	100 μF, 10 V, Aluminum Electrolytic Radial-Lead Capacitor	123013-107
C89	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C90	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C91–C94	10 μF, 35 V, Aluminum Electrolytic Radial-Lead Capacitor	24-350106
C95	220 pF, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-221
C96	47 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-470
C97	100 μF, 10 V, Aluminum Electrolytic Radial-Lead Capacitor	123013-107
C99	0.01 μF, +80% -20%, 25 V Minimum, Axial-Lead Ceramic Capacitor	122005-103
C100, C101	10 μF, 50 V, Aluminum Electrolytic Radial-Lead Capacitor	123001-106
C102	10 pF, ±5%, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-100
C103, C104	0.1 μF, 25 V, NPO Axial-Lead Ceramic Capacitor	122006-104
C105	220 pF, 100 V, NPO Axial-Lead Ceramic Capacitor	122016-221
	Diodes	
CR1	Type-1N752A, 5.6 V Diode	32-1N752A
CR2–CR4	Type-1N914, 10 mA, 100 V Switching Diode	31-1N914
CR6	Type-1N914, 10 mA, 100 V Switching Diode	31-1N914
CR8	Type-1N914, 10 mA, 100 V Switching Diode	31-1N914
CR10–CR22	Type-1N914, 10 mA, 100 V Switching Diode	31-1N914
CR26	Type-1N914, 10 mA, 100 V Switching Diode	31-1N914
CR27	Type-38MV5053 Light-Emitting Diode	38-MV5053
	Inductors	
L1	15 μH Miniature Fixed Axial-Lead Inductor	141016-004
L2	8.5–11.5 μH Variable Inductor	141017-001
L3	18 μH Miniature Fixed Axial-Lead Inductor	141016-005
L7	33 μH Miniature Fixed Axial-Lead Inductor	141016-007
L8	68 μH Miniature Fixed Axial-Lead Inductor	141016-008
L9	15 μH Miniature Fixed Axial-Lead Inductor	141016-004

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NTSC Demodulator PCB Assembly
Parts List, continued

Designator	Description	Part No.
L10	5.6 µH Miniature Fixed Axial-Lead Inductor	141016-001
L11	27 µH Miniature Fixed Axial-Lead Inductor	141016-006
L12	15 µH Miniature Fixed Axial-Lead Inductor	141016-004
L13	18 µH Miniature Fixed Axial-Lead Inductor	141016-005
L14	5.6 µH Miniature Fixed Axial-Lead Inductor	141016-001
L17	5.6 µH Miniature Fixed Axial-Lead Inductor	141016-001
L18–L20	1.0 µH Peaking Coil Inductor	141007-001
	Integrated Circuits	
DL1	500 ns Delay Line Integrated Circuit	137359-001
DL2	NTSC Delay Line Integrated Circuit	137365-001
U1	TV Chroma/Luminance Processor Integrated Circuit	137353-001
U2	Type-74LS08 Integrated Circuit	37-74LS08
U3–U5	CMOS Dual Monostable Multivibrator Integrated Circuit	137354-001
U6	Type-74LS04 Integrated Circuit	37-74LS04
U7	ECL Phase-Frequency Detector Integrated Circuit	137355-001
U8	ECL Voltage-Controlled Multi-Vibrator Integrated Circuit	137356-001
U9	Type-74LS74 Integrated Circuit	37-74LS74
U11	8-Bit D-A Converter Integrated Circuit	137159-001
U10	Type-74LS273 Octal Flip-Flop Integrated Circuit	37-74LS273
U12	Type-4066 Integrated Circuit	37-4066
U13	Type-74LS273 Octal Flip-Flop Integrated Circuit	37-74LS273
U14	8-Bit D-A Converter Integrated Circuit	137159-001
U15	Type-4066 Integrated Circuit	37-4066
U16	Type-74LS273 Octal Flip-Flop Integrated Circuit	37-74LS273
U17	8-Bit D-A Converter Integrated Circuit	137159-001
U18	Type-4066 Integrated Circuit	37-4066
U19	Type-7406 Integrated Circuit	37-7406
U20	Type-7407 Integrated Circuit	37-7407
VR1	TO-220, 15 W, Voltage Regulator Integrated Circuit	137233-001
VR2	Type-7805 Integrated Circuit	37-7805
VR3	TO-220, 15 W, Voltage Regulator Integrated Circuit	137232-001
	Resistors	
R1	75 Ω, ±5%, ¼ W Resistor	110000-750
R2	47 Ω, ±5%, ¼ W Resistor	110000-470
R3	2 kΩ ±5%, ¼ W Resistor	110000-202
R4	240 Ω, ±5%, ¼ W Resistor	110000-241
R5	910 Ω, ±5%, ¼ W Resistor	110000-911
R6, R7	560 Ω, ±5%, ¼ W Resistor	110000-561
R8	1.2 kΩ ±5%, ¼ W Resistor	110000-122
R9	1 kΩ, ±5%, ¼ W Resistor	110000-102
R10	2.7 kΩ ±5%, ¼ W Resistor	110000-272
R11	47 Ω, ±5%, ¼ W Resistor	110000-470
R12	2 kΩ ±5%, ¼ W Resistor	110000-202
R13	270 Ω, ±5%, ¼ W Resistor	110000-271

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NTSC Demodulator PCB Assembly
Parts List, continued

Designator	Description	Part No.
R14	2.7 kΩ ±5%, ¼ W Resistor	110000-272
R15	1.8 kΩ ±5%, ¼ W Resistor	110000-182
R16	1.5 kΩ, ±5%, ¼ W Resistor	110000-152
R17	150 Ω, ±5%, ¼ W Resistor	110000-151
R18	510 Ω, ±5%, ¼ W Resistor	110000-511
R19	3.9 kΩ ±5%, ¼ W Resistor	110000-392
R20	1.5 kΩ, ±5%, ¼ W Resistor	110000-152
R21	510 Ω, ±5%, ¼ W Resistor	110000-511
R22	3.3 kΩ ±5%, ¼ W Resistor	110000-332
R23	82 kΩ ±5%, ¼ W Resistor	110000-823
R24	1 kΩ, ±5%, ¼ W Resistor	110000-102
R25	220 kΩ ±5%, ¼ W Resistor	110000-224
R26	1.2 kΩ ±5%, ¼ W Resistor	110000-122
R27	1.8 kΩ ±5%, ¼ W Resistor	110000-182
R28	270 kΩ ±5%, ¼ W Resistor	110000-274
R31	47 Ω, ±5%, ¼ W Resistor	110000-470
R32	5.1 kΩ ±5%, ¼ W Resistor	110000-512
R33	470 Ω, ±5%, ¼ W Resistor	110000-471
R34	2.4 kΩ ±5%, ¼ W Resistor	110000-242
R35	510 Ω, ±5%, ¼ W Resistor	110000-511
R36	3.3 kΩ ±5%, ¼ W Resistor	110000-332
R37	15 kΩ ±5%, ¼ W Resistor	110000-153
R38	100 Ω, ±5%, ¼ W Resistor	110000-101
R39	110 kΩ ±5%, ¼ W Resistor	110000-114
R40	100 kΩ, Horizontal Trimming Potentiometer	119002-104
R41	33 kΩ ±5%, ¼ W Resistor	110000-333
R42	330 kΩ ±5%, ¼ W Resistor	110000-334
R43	100 kΩ, Horizontal Trimming Potentiometer	119002-104
R44	33 kΩ ±5%, ¼ W Resistor	110000-333
R45	330 kΩ ±5%, ¼ W Resistor	110000-334
R46	5 kΩ, Horizontal Trimming Potentiometer	119002-502
R47	8.2 kΩ ±5%, ¼ W Resistor	110000-822
R48	22 kΩ ±5%, ¼ W Resistor	110000-223
R49	15 kΩ ±5%, ¼ W Resistor	110000-153
R50	10 kΩ, Horizontal Trimming Potentiometer	119002-103
R51	12 kΩ ±5%, ¼ W Resistor	110000-123
R52	510 Ω, ±5%, ¼ W Resistor	110000-511
R53	10 kΩ ±5%, ¼ W Resistor	110000-103
R54	220 kΩ ±5%, ¼ W Resistor	110000-224
R55	12 kΩ ±5%, ¼ W Resistor	110000-123
R56	5.1 kΩ ±5%, ¼ W Resistor	110000-512
R57	1 kΩ, ±5%, ¼ W Resistor	110000-102
R58	330 Ω, ±5%, ¼ W Resistor	110000-331
R59	3.3 kΩ ±5%, ¼ W Resistor	110000-332
R60	10 Ω, ±5%, ¼ W Resistor	110000-100
R61	270 Ω, ±5%, ¼ W Resistor	110000-271

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NTSC Demodulator PCB Assembly
Parts List, continued

Designator	Description	Part No.
R62	3 kΩ ±5%, ¼ W Resistor	110000-302
R63	47 Ω, ±5%, ¼ W Resistor	110000-470
R64	2 kΩ ±5%, ¼ W Resistor	110000-202
R65	3.9 kΩ ±5%, ¼ W Resistor	110000-392
R66	39 kΩ ±5%, ¼ W Resistor	110000-393
R67	47 Ω, ±5%, ¼ W Resistor	110000-470
R68	4.7 kΩ ±5%, ¼ W Resistor	110000-472
R69	2.2 kΩ ±5%, ¼ W Resistor	110000-222
R70	3 kΩ ±5%, ¼ W Resistor	110000-302
R71	47 Ω, ±5%, ¼ W Resistor	110000-470
R72	2 kΩ ±5%, ¼ W Resistor	110000-202
R73	3.9 kΩ ±5%, ¼ W Resistor	110000-392
R74	39 kΩ ±5%, ¼ W Resistor	110000-393
R75	47 Ω, ±5%, ¼ W Resistor	110000-470
R76	4.7 kΩ ±5%, ¼ W Resistor	110000-472
R77	2.2 kΩ ±5%, ¼ W Resistor	110000-222
R78	3 kΩ ±5%, ¼ W Resistor	110000-302
R79	2 kΩ ±5%, ¼ W Resistor	110000-202
R80	47 Ω, ±5%, ¼ W Resistor	110000-470
R81	3.9 kΩ ±5%, ¼ W Resistor	110000-392
R82	47 Ω, ±5%, ¼ W Resistor	110000-470
R83	39 kΩ ±5%, ¼ W Resistor	110000-393
R84	4.7 kΩ ±5%, ¼ W Resistor	110000-472
R85, R86	2.2 kΩ ±5%, ¼ W Resistor	110000-222
R87	10 kΩ ±5%, ¼ W Resistor	110000-103
R88	5.1 kΩ ±5%, ¼ W Resistor	110000-512
R89	10 kΩ ±5%, ¼ W Resistor	110000-103
R90	110 kΩ ±5%, ¼ W Resistor	110000-114
R91	10 kΩ ±5%, ¼ W Resistor	110000-103
R92	270 kΩ ±5%, ¼ W Resistor	110000-274
R93	330 Ω, ±5%, ¼ W Resistor	110000-331
R94	1 kΩ, ±5%, ¼ W Resistor	110000-102
R95	15 kΩ ±5%, ¼ W Resistor	110000-153
R96	100 kΩ ±5%, ¼ W Resistor	110000-104
R97	68 Ω, ±5%, ¼ W Resistor	110000-680
R98	2.2 kΩ ±5%, ¼ W Resistor	110000-222
R99	120 Ω ±5%, ¼ W Resistor	110000-121
R100	1 kΩ, ±5%, ¼ W Resistor	110000-102
R101	1.0 kΩ, ½ W Vertical Trimming Potentiometer	119001-102
R102	3.9 kΩ ±5%, ¼ W Resistor	110000-392
R103	1.2 kΩ ±5%, ¼ W Resistor	110000-122
R104	5.1 kΩ ±5%, ¼ W Resistor	110000-512
R105	10 kΩ, Horizontal Trimming Potentiometer	119002-103
R106	47 Ω, ±5%, ¼ W Resistor	110000-470
R107	18 kΩ ±5%, ¼ W Resistor	110000-183
R108, R109	510 Ω, ±5%, ¼ W Resistor	110000-511

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NTSC Demodulator PCB Assembly
Parts List, continued

Designator	Description	Part No.
R110	3 kΩ ±5%, ¼ W Resistor	110000-302
R111	100 Ω, ±5%, ¼ W Resistor	110000-101
R112	47 Ω, ±5%, ¼ W Resistor	110000-470
R113	220 Ω, ±5%, ¼ W Resistor	110000-221
R114	1 kΩ, ±5%, ¼ W Resistor	110000-102
R115	150 Ω, ±5%, ¼ W Resistor	110000-151
R116	47 Ω, ±5%, ¼ W Resistor	110000-470
R117	1 kΩ, ±5%, ¼ W Resistor	110000-102
R118	2 kΩ ±5%, ¼ W Resistor	110000-202
R119	1 kΩ, ±5%, ¼ W Resistor	110000-102
R120	2 kΩ ±5%, ¼ W Resistor	110000-202
R121	47 Ω, ±5%, ¼ W Resistor	110000-470
R122, R123	1.2 kΩ ±5%, ¼ W Resistor	110000-122
R124	270 Ω, ±5%, ¼ W Resistor	110000-271
R125	1.2 kΩ ±5%, ¼ W Resistor	110000-122
R126	240 Ω, ±5%, ¼ W Resistor	110000-241
R127	2.7 kΩ ±5%, ¼ W Resistor	110000-272
R128, R129	8.2 kΩ ±5%, ¼ W Resistor	110000-822
R130, R131	10 Ω, ±5%, ¼ W Resistor	110000-100
R132	3.9 kΩ ±5%, ¼ W Resistor	110000-392
R133	5.1 kΩ ±5%, ¼ W Resistor	110000-512
R134	1.2 kΩ ±5%, ¼ W Resistor	110000-122
R135	10 kΩ, Horizontal Trimming Potentiometer	119002-103
R136	47 Ω, ±5%, ¼ W Resistor	110000-470
R137	18 kΩ ±5%, ¼ W Resistor	110000-183
R138, R139	510 Ω, ±5%, ¼ W Resistor	110000-511
R140	3 kΩ ±5%, ¼ W Resistor	110000-302
R150	100 Ω, ±5%, ¼ W Resistor	110000-101
R151	47 Ω, ±5%, ¼ W Resistor	110000-470
R152	220 Ω, ±5%, ¼ W Resistor	110000-221
R153	1 kΩ, ±5%, ¼ W Resistor	110000-102
R154	150 Ω, ±5%, ¼ W Resistor	110000-151
R155	47 Ω, ±5%, ¼ W Resistor	110000-470
R156	1 kΩ, ±5%, ¼ W Resistor	110000-102
R157	2 kΩ ±5%, ¼ W Resistor	110000-202
R158	1 kΩ, ±5%, ¼ W Resistor	110000-102
R159	2 kΩ ±5%, ¼ W Resistor	110000-202
R160	47 Ω, ±5%, ¼ W Resistor	110000-470
R161–R163	1.2 kΩ ±5%, ¼ W Resistor	110000-122
R164	270 Ω, ±5%, ¼ W Resistor	110000-271
R165	240 Ω, ±5%, ¼ W Resistor	110000-241
R166	2.7 kΩ ±5%, ¼ W Resistor	110000-272
R167, R168	8.2 kΩ ±5%, ¼ W Resistor	110000-822
R169, R170	10 Ω, ±5%, ¼ W Resistor	110000-100
R171	3.9 kΩ ±5%, ¼ W Resistor	110000-392
R172	5.1 kΩ ±5%, ¼ W Resistor	110000-512

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NTSC Demodulator PCB Assembly
Parts List, continued

Designator	Description	Part No.
R173	1.2 kΩ ±5%, ¼ W Resistor	110000-122
R174	10 kΩ, Horizontal Trimming Potentiometer	119002-103
R175	47 Ω, ±5%, ¼ W Resistor	110000-470
R176	18 kΩ ±5%, ¼ W Resistor	110000-183
R177	510 Ω, ±5%, ¼ W Resistor	110000-511
R178	3 kΩ ±5%, ¼ W Resistor	110000-302
R179	510 Ω, ±5%, ¼ W Resistor	110000-511
R180	100 Ω, ±5%, ¼ W Resistor	110000-101
R181	47 Ω, ±5%, ¼ W Resistor	110000-470
R182	220 Ω, ±5%, ¼ W Resistor	110000-221
R183	1 kΩ, ±5%, ¼ W Resistor	110000-102
R184	150 Ω, ±5%, ¼ W Resistor	110000-151
R185	47 Ω, ±5%, ¼ W Resistor	110000-470
R186–R190	1 kΩ, ±5%, ¼ W Resistor	110000-102
R191	2 kΩ ±5%, ¼ W Resistor	110000-202
R192	1 kΩ, ±5%, ¼ W Resistor	110000-102
R193	2 kΩ ±5%, ¼ W Resistor	110000-202
R194	47 Ω, ±5%, ¼ W Resistor	110000-470
R195–R197	1.2 kΩ ±5%, ¼ W Resistor	110000-122
R198	270 Ω, ±5%, ¼ W Resistor	110000-271
R199	240 Ω, ±5%, ¼ W Resistor	110000-241
R200	2.7 kΩ ±5%, ¼ W Resistor	110000-272
R201, R202	8.2 kΩ ±5%, ¼ W Resistor	110000-822
R203, R204	10 Ω, ±5%, ¼ W Resistor	110000-100
R205	15 Ω, ±5%, 10 W Wirewound Resistor	116000-150
R206	47 Ω, ±5%, 5 W Wirewound Resistor	116007-470
R207	120 Ω ±5%, ¼ W Resistor	110000-121
R208	820 Ω, ±5%, ¼ W Resistor	110000-821
R209	1 kΩ, ±5%, ¼ W Resistor	110000-102
R210	3.9 kΩ ±5%, ¼ W Resistor	110000-392
R211	240 Ω, ±5%, ¼ W Resistor	110000-241
R212	130 kΩ ±5%, ¼ W Resistor	110000-132
R213	500 Ω, Horizontal Trimming Potentiometer	119002-501
R214	15 Ω, ±5%, 5 W Flame-Proof Wirewound Resistor	116007-150
R215	200 Ω, Horizontal Trimming Potentiometer	119002-201
R216	560 Ω, ±5%, ¼ W Resistor	110000-561
R218	510 Ω, ±5%, ¼ W Resistor	110000-511
R219–R223	560 Ω, ±5%, ¼ W Resistor	110000-561
R224	2.2 kΩ ±5%, ¼ W Resistor	110000-222
R225–R227	910 Ω, ±5%, ¼ W Resistor	110000-911
R228	5.1 kΩ ±5%, ¼ W Resistor	110000-512
R229	220 Ω, ±5%, ¼ W Resistor	110000-221
R230	150 Ω, ±5%, ¼ W Resistor	110000-151
R231–R233	500 Ω, Horizontal Trimming Potentiometer	119002-501
R234	270 Ω, ±5%, ¼ W Resistor	110000-271

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NTSC Demodulator PCB Assembly
Parts List, continued

Designator	Description	Part No.
R235	560 Ω, ±5%, ¼ W Resistor	110000-561
R236	5 kΩ, Horizontal Trimming Potentiometer	119002-502
R237	47 Ω, ±5%, ¼ W Resistor	110000-470
R239, R240	1 kΩ, ±5%, ¼ W Resistor	110000-102
R241, R242	47 Ω, ±5%, ¼ W Resistor	110000-470
R243–R245	100 Ω, ±5%, ¼ W Resistor	110000-101
R246	150 Ω, ±5%, ¼ W Resistor	110000-151
TP1	0 Ω (Dummy) Resistor	110005-001
W1	0 Ω (Dummy) Resistor	110005-001
W3, W4	0 Ω (Dummy) Resistor	110005-001
	Transistors	
Q1	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q2	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q3	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q4	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q5, Q6	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q7	25 V, 200 mA, NPN Transistor	133024-001
Q8–Q10	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q11	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q12	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q13	Type-2N3823 N-Channel, VHF FET Transistor	133023-001
Q14	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q15	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q16	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q17	Type-2N3823 N-Channel, VHF FET Transistor	133023-001
Q18	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q19	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q20	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q21	Type-2N3823 N-Channel, VHF FET Transistor	133023-001
Q22	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q23	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q27	25 V, 100 mA NPN Transistor	133025-001
Q28	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q29, Q30	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q31	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q32, Q33	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q34	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q35	Type-2N3643, 60 V, 300 mW, NPN Transistor	34-2N3643
Q36	Type-2N3644 PNP Transistor	34-2N3644
Q37, Q38	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q39	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q40, Q41	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q42	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906

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NTSC Demodulator PCB Assembly
Parts List, continued

Designator	Description	Part No.
Q43	Type-2N3643, 60 V, 300 mW, NPN Transistor	34-2N3643
Q44	Type-2N3644 PNP Transistor	34-2N3644
Q45, Q46	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q47	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q48, Q49	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q50	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q51	Type-2N3643, 60 V, 300 mW, NPN Transistor	34-2N3643
Q52	Type-2N3644 PNP Transistor	34-2N3644
Q53	Type-2N3563 NPN Transistor	133027-001
Q54	Type-2N3906, 40 V, 1 W, PNP Transistor	33-2N3906
Q55	Type-2N3904, 60 V, 350 mW, NPN Switching Transistor	34-2N3904
Q57	25 V, 100 mA NPN Transistor	133025-001
	Miscellaneous	
DL2	14-Circuit PC Mount, Receptacle Connector	179193-014
J11	7-Circuit, Right-Angle Connector Header	179165-007
J17	7-Circuit, Right-Angle Connector Header	179165-007
J18	50-Circuit, Right-Angle, 4-Wall Header Connector	179186-001
J19	#2-56x Self-Tapping Screw	72-6204S
J19	Right-Angle, PC Mount, BNC Receptacle Connector	179013-002
Y1	3.5795 MHz, HC-18/U Crystal	144007-01
TP1, TP2	Test Point (Acceptable substitute is part no. 020670-01)	179051-002
TP11–TP16	Test Point (Acceptable substitute is part no. 020670-01)	179051-002
TP18	Test Point (Acceptable substitute is part no. 020670-01)	179051-002
TP21–TP31	Test Point (Acceptable substitute is part no. 020670-01)	179051-002
	Snap-In Fastener	81-4302
	Standoff	178050-008

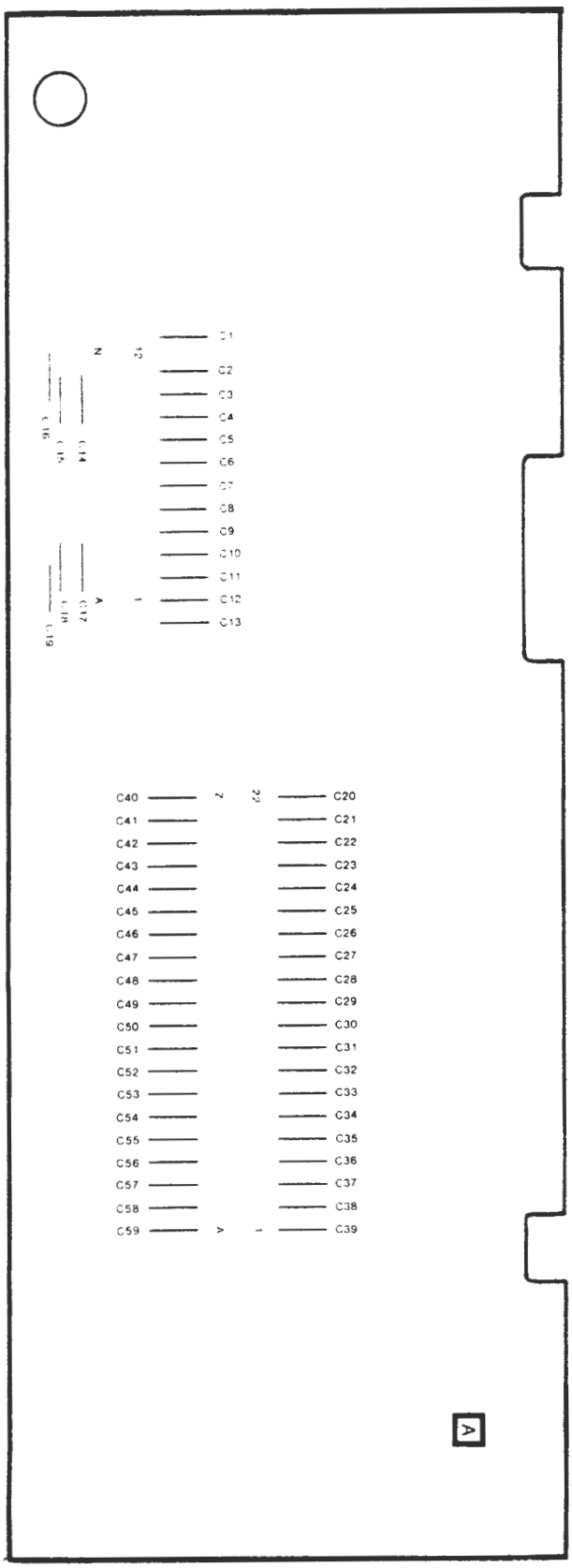


Figure 5-12 EMI Shield PCB Assembly
A040993-01 B

EMI Shield PCB Assembly
Parts List

Designator	Description	Part No.
	Capacitors	
C1	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C2–C12	0.1 μF, +80% -20%, 50 V, Ceramic Capacitor	122002-104
C13	100 pF, 100 V, Ceramic Axial-Lead Capacitor	122016-101
C14	0.1 μF, +80% -20%, 50 V, Ceramic Capacitor	122002-104
C15, C16	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C17, C18	100 pF, 100 V, Ceramic Axial-Lead Capacitor	122016-101
C19, C20	0.1 μF, +80% -20%, 50 V, Ceramic Capacitor	122002-104
C21, C22	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C23–C26	0.01 μF, +80% -20%, 25 V Minimum, Ceramic Axial-Lead Capacitor	122005-103
C27, C28	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C29, C30	0.01 μF, +80% -20%, 25 V Minimum, Ceramic Axial-Lead Capacitor	122005-103
C31–C34	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C35	0.1 μF, +80% -20%, 50 V, Ceramic Capacitor	122002-104
C36	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C37, C38	0.01 μF, +80% -20%, 25 V Minimum, Ceramic Axial-Lead Capacitor	122005-103
C39, C40	0.1 μF, +80% -20%, 50 V, Ceramic Capacitor	122002-104
C41, C42	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C43–C46	0.01 μF, +80% -20%, 25 V Minimum, Ceramic Axial-Lead Capacitor	122005-103
C47, C48	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C49–C51	0.01 μF, +80% -20%, 25 V Minimum, Ceramic Axial-Lead Capacitor	122005-103
C52, C53	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C54, C55	0.1 μF, +80% -20%, 50 V, Ceramic Capacitor	122002-104
C56–C58	1000 pF, ±5%, 100 V, NPO, Ceramic Axial-Lead Capacitor (Acceptable substitute is part no. 122002-102)	122016-102
C59	0.1 μF, +80% -20%, 50 V, Ceramic Capacitor	122002-104
	Connectors	
J16	44-Pin Edge Connector (Acceptable substitute is part no. 179046-044)	179073-044
J20	24-Pin Edge Connector	179073-024
	Miscellaneous	
	Spacer	041799-01
	Spacer	041800-01
	#4-40 × ¼ Cross-Recessed Pan-Head Screw	72-1404F
	¼-Inch Grommet	178044-242
	¼-Inch White Plunger	178045-442
	Flat Nylon Washer	175009-221

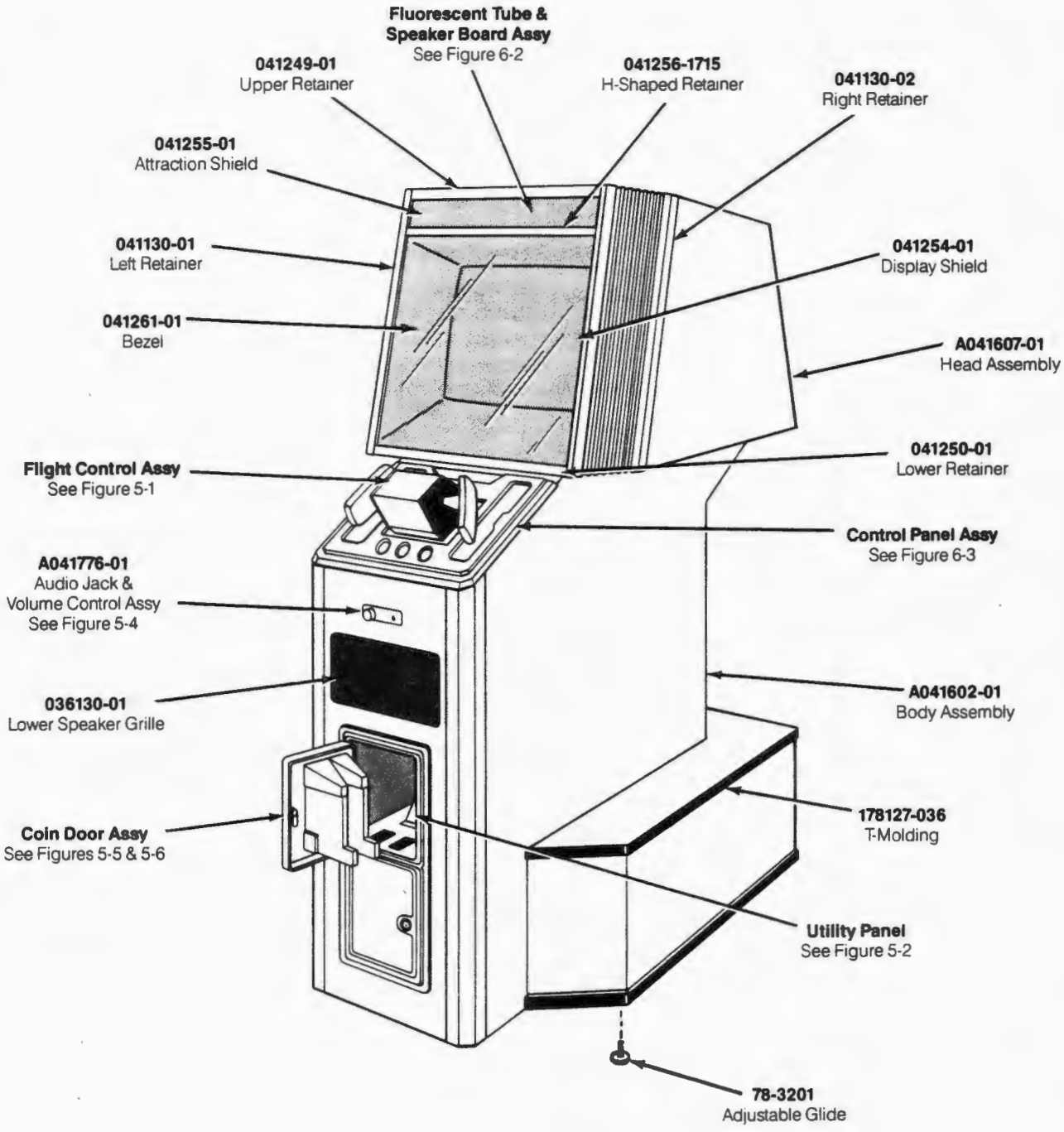


Figure 6-1 Cabinet-Mounted Assemblies
A041600-xx B

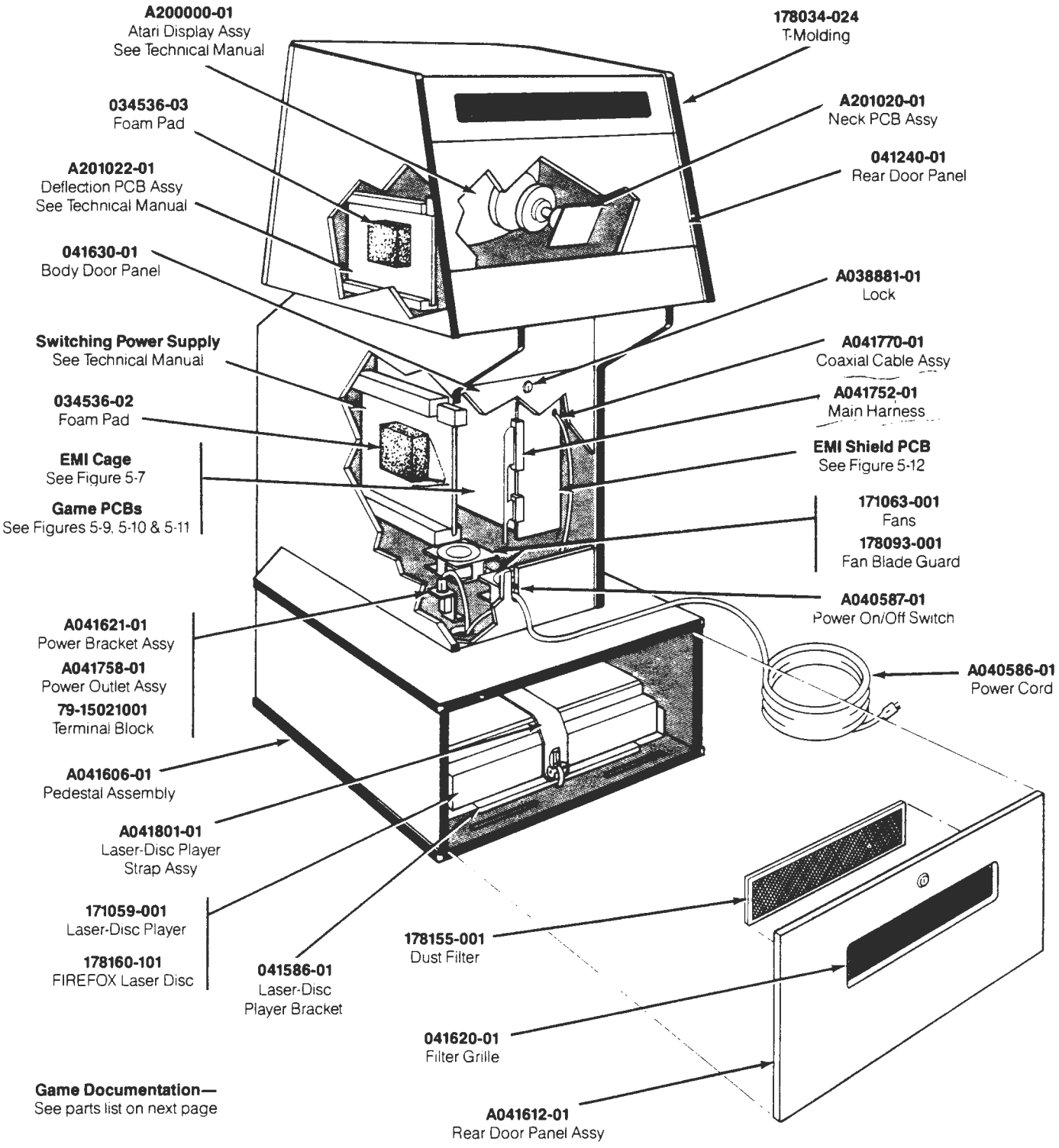
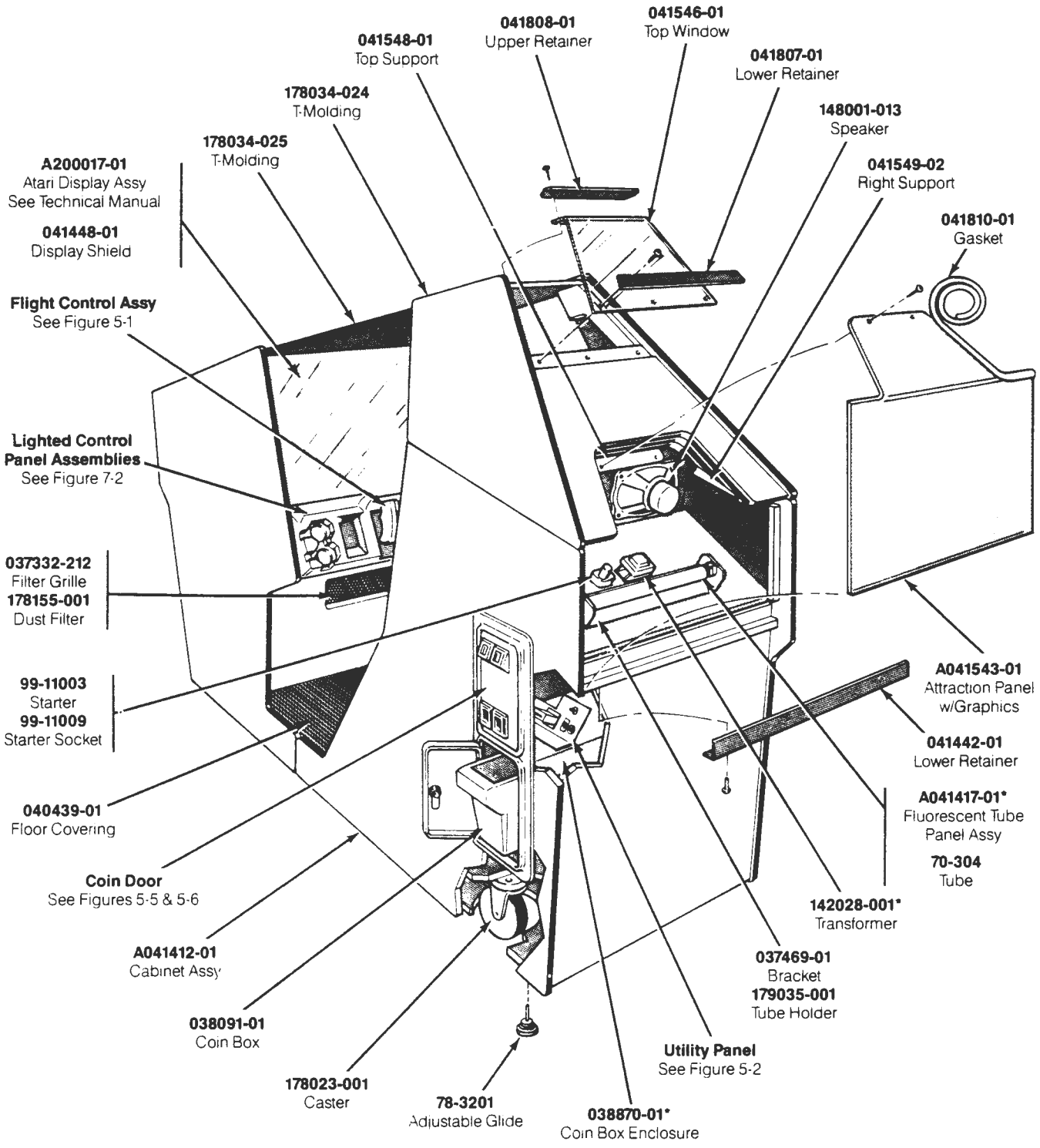


Figure 6-1 Cabinet-Mounted Assemblies, continued
A041600-xx B



*** See following parts list for different Ireland part no.**

Figure 7-1 Cabinet-Mounted Assemblies
US-Built A041411-01 A
Ireland-Built A041411-03 A

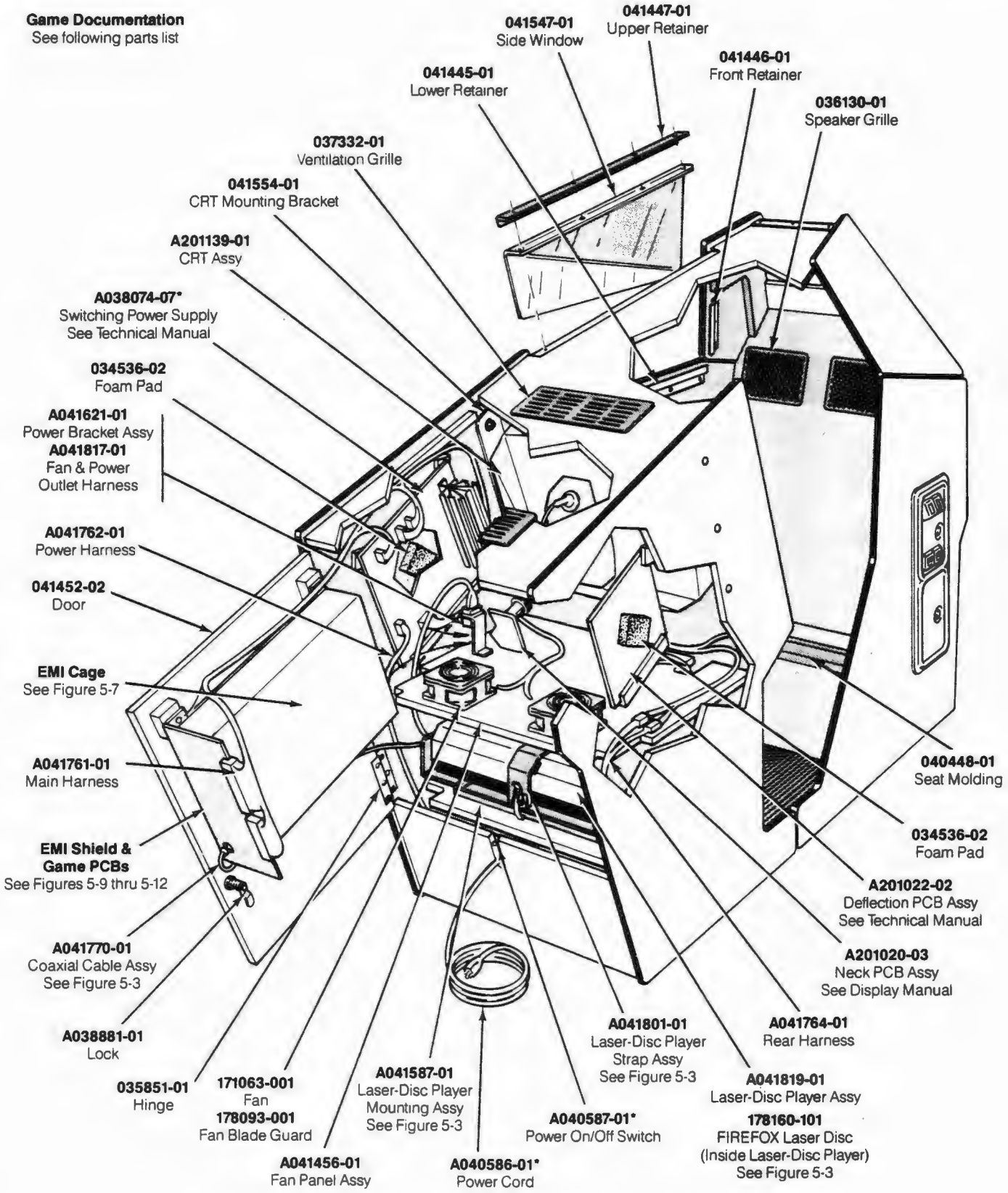


Figure 7-1 Cabinet-Mounted Assemblies, continued
US-Built A041411-01 A
Ireland-Built A041411-03 A